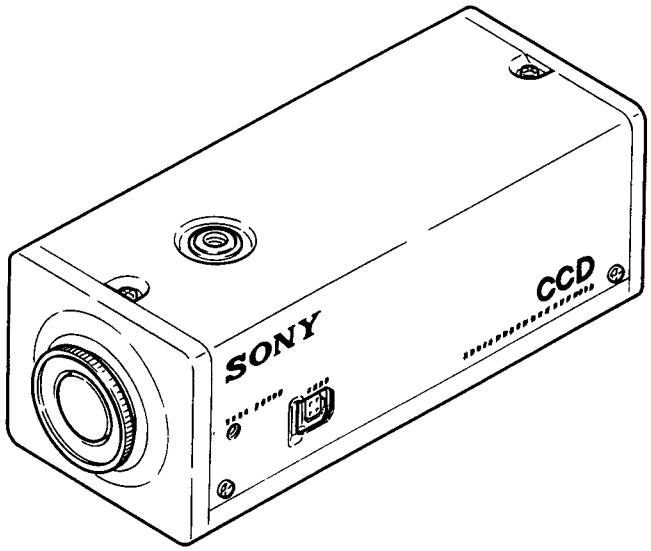
SSC-M370/M370CE

SERVICE MANUAL



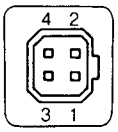
SPECIFICATIONS

Imaging system

Pickup device	Inter-line transfer type CCD
Effective picture elements	
	UC: 768 × 494 (horizontal/vertical)
	EK: 752 × 582 (horizontal/vertical)
Sensing area	6.3 × 4.7 mm (¼ × 3/16 inches)

Optical system and miscellaneous

Lens mount	C mount
Signal system	UC: EIA standard
	EK: CCIR standard
Scanning system	UC: 525 lines, 2:1 interlace, 30 frames per second
	EK: 625 lines, 2:1 interlace, 25 frames per second
Synchronization	Internal or external (automatic switching)
External synchronizing signal input	
	VS (sync level 0.3 Vp-p, 75 ohms)
Horizontal resolution	570 TV lines
Minimum illumination	0.5 lux at F/1.2 (AGC on)
Video output	1.0 Vp-p, 75 ohms, sync negative
Video S/N ratio	50 dB minimum (AGC off)
Electronic shutter	UC: 8 settings: 1/60 s, 1/100 s, 1/250 s, 1/500 s, 1/1000 s, 1/2000 s, 1/4000 s, 1/10000 s
	EK: 8 settings: 1/50 s, 1/120 s, 1/250 s, 1/500 s, 1/1000 s, 1/2000 s, 1/4000 s, 1/10000 s
AGC	Switchable on/off
Input and output connectors	
	DC 12V terminals
	VIDEO OUT (when using combined power cable: DC IN.VS IN/VIDEO OUT) BNC type
	VS IN (when using combined power cable: MONITOR OUT) BNC type
	LENS: 4-pin connector (pin assignment as follows)



Side of camera body

Pin	Signal
1	Power supply (9 V DC, 50 mA)
2	Unused
3	Video output signal for lens (0.7 Vp-p, no synchronization signal)
4	Ground

Power requirements	For 12 V DC supply: 12 V DC ± 10%
	For YS-W130/W230 camera adaptor: 24 V DC ±5 V
Power consumption	For 12 V DC supply: 2.8 W
	For YS-W130 /W230 camera adaptor: 4.0 W
Operating temperature	−10°C to 50°C (14°F to 122°F)
Storage temperature	−40°C to 60°C (−40°F to 140°F)
Relative humidity (operating)	20% to 80%
Relative humidity (storage)	20% to 95%
Shock resistance	70 G
External dimensions (w/h/d)	64 (mm) × 57 (mm) × 155 (mm) (2 5/8 × 2¼ × 6 1/8 inches) (excluding external projections)
Weight	660 g approx. (1 lb 7 oz)
Accessories supplied	Lens mount cap
	4-pin plug for lens cable
	Operation manual

Recommended equipment

UC: YS-W130/W230 camera adaptor
EK: YS-W130P/W230P camera adaptor

Design and specifications are subject to change without notice.

CCD Black-and-White Video Camera

SONY

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SECTION 1
GENERAL

1-1. FEATURES

The SSC-M370/M370CE black-and-white video camera uses a 1/2-inch CCD (Charge Coupled Device) with 768 (SSC-M370)/752 (SSC-M370CE) (horizontal) by 494 (SSC-M370)/582 (SSC-M370CE) (vertical) picture elements. The following are some of its principal features.

High resolution
The number of CCD picture elements (about 380,000) is sufficient to ensure high resolution.

High sensitivity
Gives a clear picture even under very gloomy conditions.

CCD IRIS function
Even when a manual iris lens is fitted, the sensitivity is automatically adjusted according to the incident light level. This keeps the video signal at a suitable level.

Electronic shutter function
Eight shutter speeds are available, for various shooting conditions.

External synchronization
A number of cameras can be synchronized with the same reference synchronizing signal so that they can be controlled by a video switcher; you can switch from a camera to another without causing picture distortion on the monitor screen.

Combined power cable (using YS-W130/W230 camera adaptor)
A single 75-ohm coaxial cable (not supplied) connecting the camera to a YS-W130/W130P/W230/W230P camera adaptor (not supplied) carries the video output signal, as well as the power supply input and external synchronizing signal.

Auto-iris lenses
A C-mount auto-iris lens can be used, by connecting the lens cable with the plug supplied.

1-2. NOTES ON USE

Power supply
This unit must always be poerated with a 12 V DC power supply, or using the YS-W130/W130P/W230/W230P camera adaptor (not supplied).

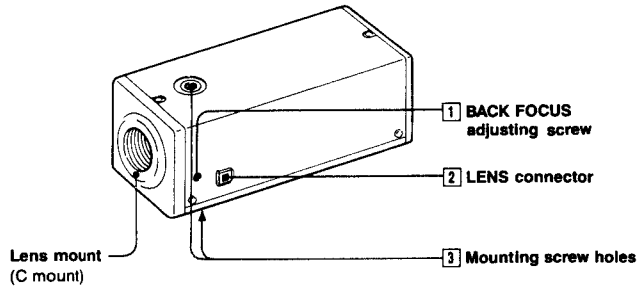
Handling of the unit
Be careful not to spill water or other liquids on the unit, or to get combustible or metallic material inside the body. If used with foreign matter inside, the camera is liable to fail, or be a cause of fire or electric shock.

Operating and storage locations
Avoid shooting a very bright object (such as light fittings) for an extended period. Avoid operating or storing the unit in the following locations.
- Extremely hot or cold places (operating temperature −10°C to 50°C; 14°F to 122°F)
- Damp or dusty places
- Where it is exposed to rain
- Locations subject to strong vibration
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters

Care of the unit
- Remove dust or dirt on the surface of the lens or glass cover with a blower.
- Clean the body with a dry soft cloth. If it is very dirty, use a cloth dampened with a small quantity of neutral detergent, then wipe dry. Avoid the use of volatile solvents such as thinners, alcohol, benzene, and insecticides. They may damage the surface finish, or impair the operation of the camera.

1-3. LOCATION AND FUNCTION OF PARTS AND CONTROLS

Front and side



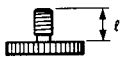
1 BACK FOCUS adjusting screw
The camera is shipped with the back focus adjusted to suit almost all lenses. If necessary, turn this screw with a screwdriver to adjust the focal plane. It has a self-locking mechanism, so once adjusted the focus will not drift.

2 LENS connector (4-pin)
When using an auto-iris or zoom lens, replace the plug on the lens cable with the plug supplied with the camera, and plug into this connector.

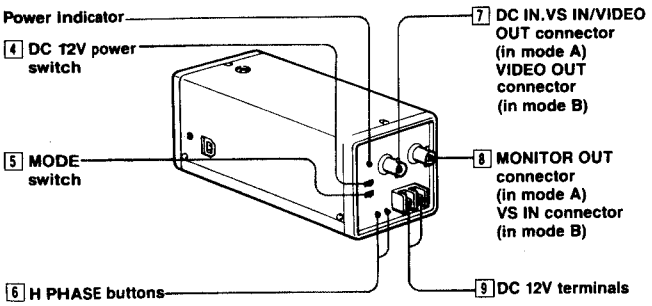
3 Mounting screw holes
Use these holes to fix the camera to a mounting bracket or tripod. The mounting screw must be as follows.

1/4″ UNC (20 pitch)

ℓ: 4.5 mm ±0.2 mm (ISO standard), or 0.197″ (ASA standard)



Rear


Power indicator
4 DC 12V power switch
5 MODE switch
6 H PHASE buttons
7 DC IN.VS IN/VIDEO OUT connector (in mode A) VIDEO OUT connector (in mode B)
8 MONITOR OUT connector (in mode A) VS IN connector (in mode B)
9 DC 12V terminals

4 DC 12V power switch
This turns the power on and off when using a 12 V DC power supply directly connected. It has no effect when the camera is used with a YS-W130/W130P/W230/W230P camera adaptor.

5 MODE switch
This switch determines the power supply mode.
Mode A: for use with a YS-W130/W130P/W230/W230P camera adaptor (not supplied).
Mode B: for use with a 12 V DC power supply connected to the terminals 9.
The video connectors 7 and 8 also have different functions depending on the mode setting.

6 H PHASE (horizontal phase) buttons
Use these buttons to compensate for horizontal phase discrepancies which will occur when the camera is used with an extended cable. Use the tip of a ball-point pen or similar instrument to press the buttons, which are recessed.

7 DC IN.VS IN/ VIDEO OUT connector (in mode A)/ VIDEO OUT connector (in mode B)
This is a BNC type coaxial connector to be used as follows depending on the setting of the MODE switch 5.

MODE setting	Input	Output	Connected to:
A	Power supply and external synchronizing signal	Video signal	YS-W130/W130P/ W230/W230P camera adaptor
B	——	Video signal	Video monitor or switcher

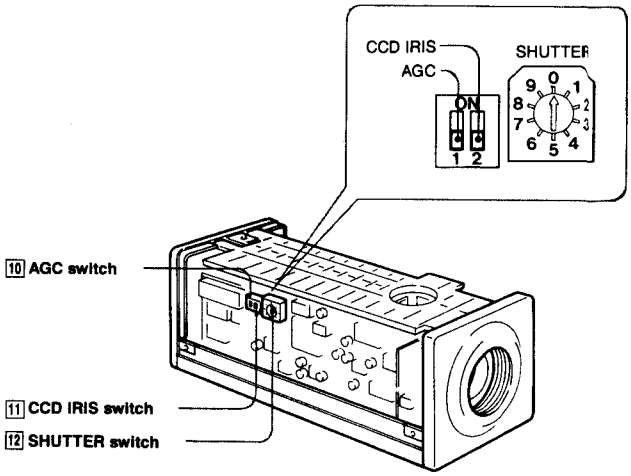
8 MONITOR OUT connector (in mode A)/VS IN connector (in mode B)
This is a BNC type coaxial connector to be used as follows depending on the setting of the MODE switch 5.

MODE setting	Input	Output	Connected to:
A	——	Video signal	Video monitor
B	External synchronizing signal	——	Synchronizing signal generator

Caution
When using the camera with a 12 V DC power supply directly conected, if the MODE switch 5 setting is left at A, then a video monitor connected to this connector will not get a correct video signal. In this case, set the MODE switch 5 to B, and connect the monitor to the VIDEO OUT connector 7.

9 DC 12V terminals
Connect these terminals to a 12 V DC power supply.
+: +12 V
−: ground
When using a 12 V DC supply connected directly to these terminals, always set the MODE switch 5 to B.

Internal switches



10 AGC switch
This switches the automatic gain control on or off.

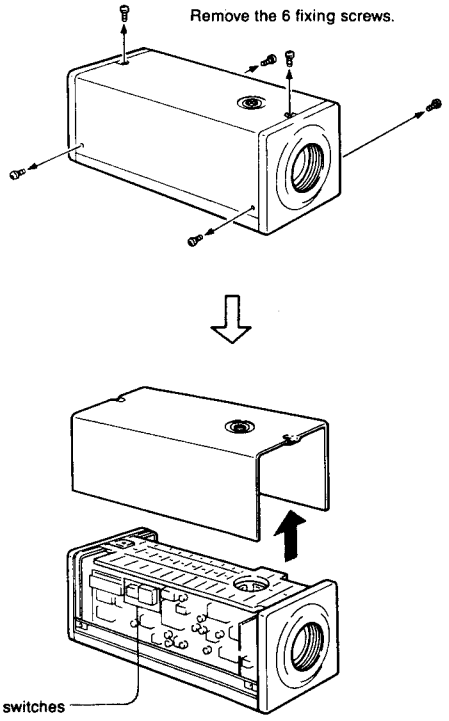
11 CCD IRIS switch
This switches on and off the CCD IRIS function, which automatically adjusts the sensitivity according to the incident light conditions.

12 SHUTTER switch
This switch is effective when the CCD IRIS switch is off. It sets the shutter speed to any of eight fixed settings, from 1/60 to 1/10000 second.

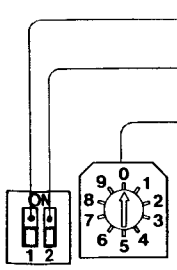
1-4. INTERNAL SWITCH SETTINGS

Before installing the camera, set the internal switches according to the following procedure.

1 Remove the upper cover from the camera body.



2 Set the switches according to the conditions in which the camera is to be used.



Switch	Settings	Factory setting
AGC	ON OFF (gain: 0 dB)	ON
CCD IRIS*	ON OFF	ON
SHUTTER	(only effective when CCD IRIS is off) 0: 1/60 s (SSC-M370) 0: 1/50 s (SSC-M370CE) 1: 1/100 s (SSC-M370) 1: 1/120 s (SSC-M370CE) 2: 1/250 s 3: 1/500 s 4: 1/1000 s 5: 1/2000 s 6: 1/4000 s 7: 1/10000 s	0

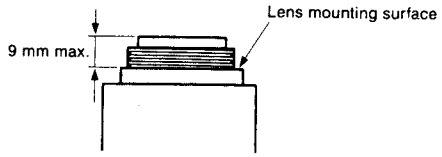
3 Replace the upper cover on the camera body.

* CCD IRIS function. When using a manual iris lens, this function automatically adjusts the shutter speed to maintain a suitable exposure level. Turn this switch off when using an auto-iris lens.

1-5. MOUNTING THE LENS

Suitable lenses

The lens must be a C mount type, and the screw thread must not project more than 9 mm ($^3/_8$ inches) from the lens mounting surface.



This camera uses a 1/2-inch CCD, so the lens should be for use with this size of CCD. In particular, if used with a lens for a 2/3-inch CCD the angle of view will be different.

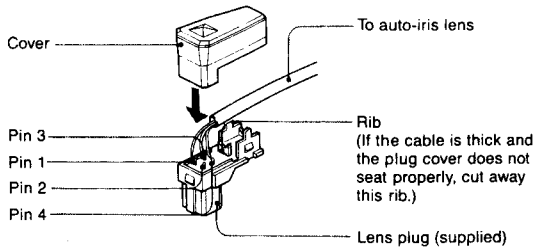
Plug fitting for an auto-iris lens

The camera is supplied with a plug to fit the LENS connector. To connect an auto-iris lens, first replace the plug on the lens cable with the plug supplied.

1 Solder the lens cable wires to the pins on the plug supplied; apply heat after putting heat shrink sleeving on the wires. The pin assignment is as follows.

Pin 1: Power supply (+9 V DC, 50 mA)
Pin 2: Unused
Pin 3: Video signal output (for auto-iris control; 0.7 Vp-p, 40 k ohms, no synchronizing signal)
Pin 4: Ground
(Refer to the operation manual for the lens to determine the cable color coding.)

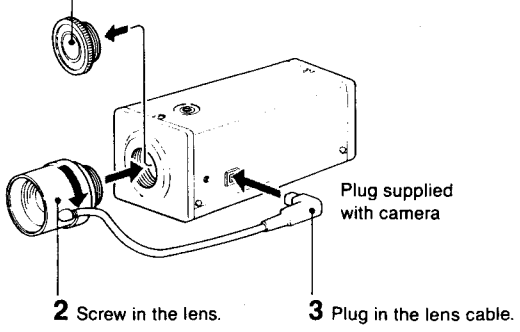
2 Put the cover on the plug.



Fitting the lens

When using an auto-iris lens, fit it as follows. For a manual iris lens, omit step **3**.

1 Unscrew the lens mount cap.

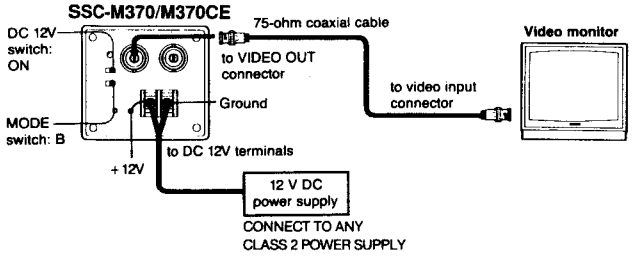


1-6. CONNECTIONS

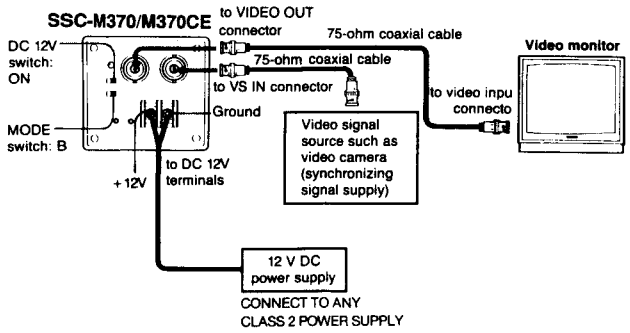
Connecting to a 12 V DC Power Supply

Set the MODE switch to B, connect the power supply, then turn the DC 12V switch on.

Operating with an internal synchronizing signal



Operating with an external synchronizing signal



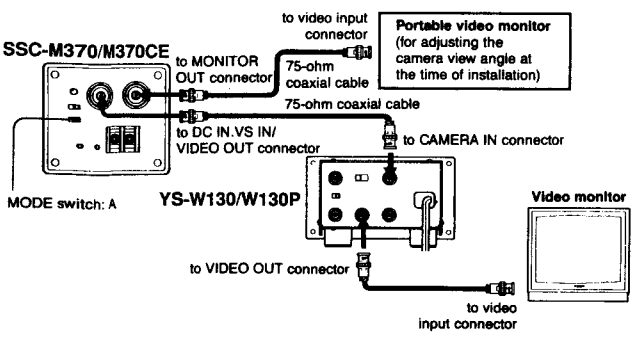
Connecting to a YS-W130/W130P Camera Adaptor (Not Supplied) (Combined Power Cable)

The following table gives the maximum lengths of the 75-ohm coaxial cable.

Cable type	RG-59B/U (3C-2V)	RG-6A/U (5C-2V)	RG-11A/U (7C-2V)
Maximum cable length	300 m (984 ft)	500 m (1640 ft)	600 m (1968 ft)

Set the MODE switch to A, make the connections, then turn on the POWER switch on the YS-W130/W130P camera adaptor.

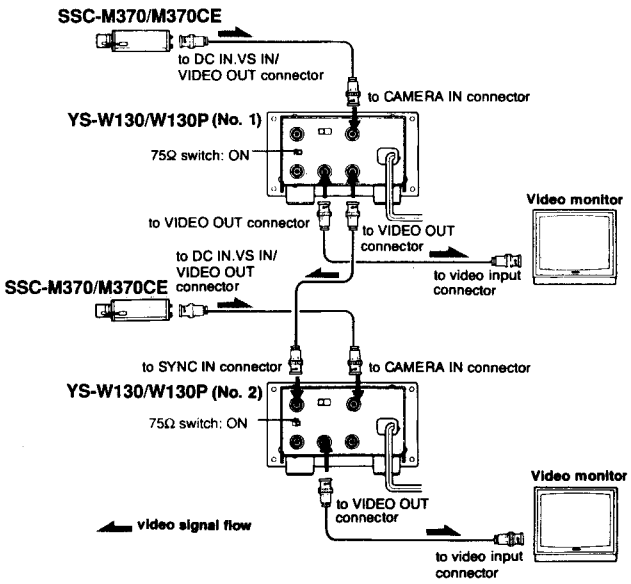
Using a single camera


SSC-M370/M370CE
to video input connector
Portable video monitor (for adjusting the camera view angle at the time of installation)
to MONITOR OUT connector
75-ohm coaxial cable
75-ohm coaxial cable
to DC IN.VS IN/ VIDEO OUT connector
to CAMERA IN connector
MODE switch: A
YS-W130/W130P
Video monitor
to VIDEO OUT connector
to video input connector

Using a number of synchronized cameras

The output video signal of one camera can be used for synchronizing the other cameras. The connections for a two-camera system are illustrated below.

For synchronizing more than two cameras, you are recommended to use a YS-W230/W230P camera adaptor. You can connect up to four cameras to a single YS-W230/W230P.

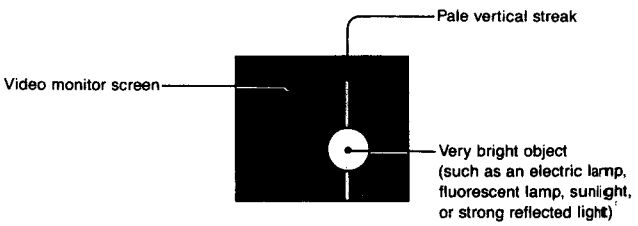


1-7. CCD CHARACTERISTICS

The following conditions that may be observed when using a CCD camera are not associated with any fault of the camera.

Vertical smear

This phenomenon occurs when shooting a very bright object.


Pale vertical streak
Video monitor screen
Very bright object (such as an electric lamp, fluorescent lamp, sunlight, or strong reflected light)

Patterned noise

This is a fixed pattern which may appear over the entire monitor screen when the camera is operated at a high temperature.

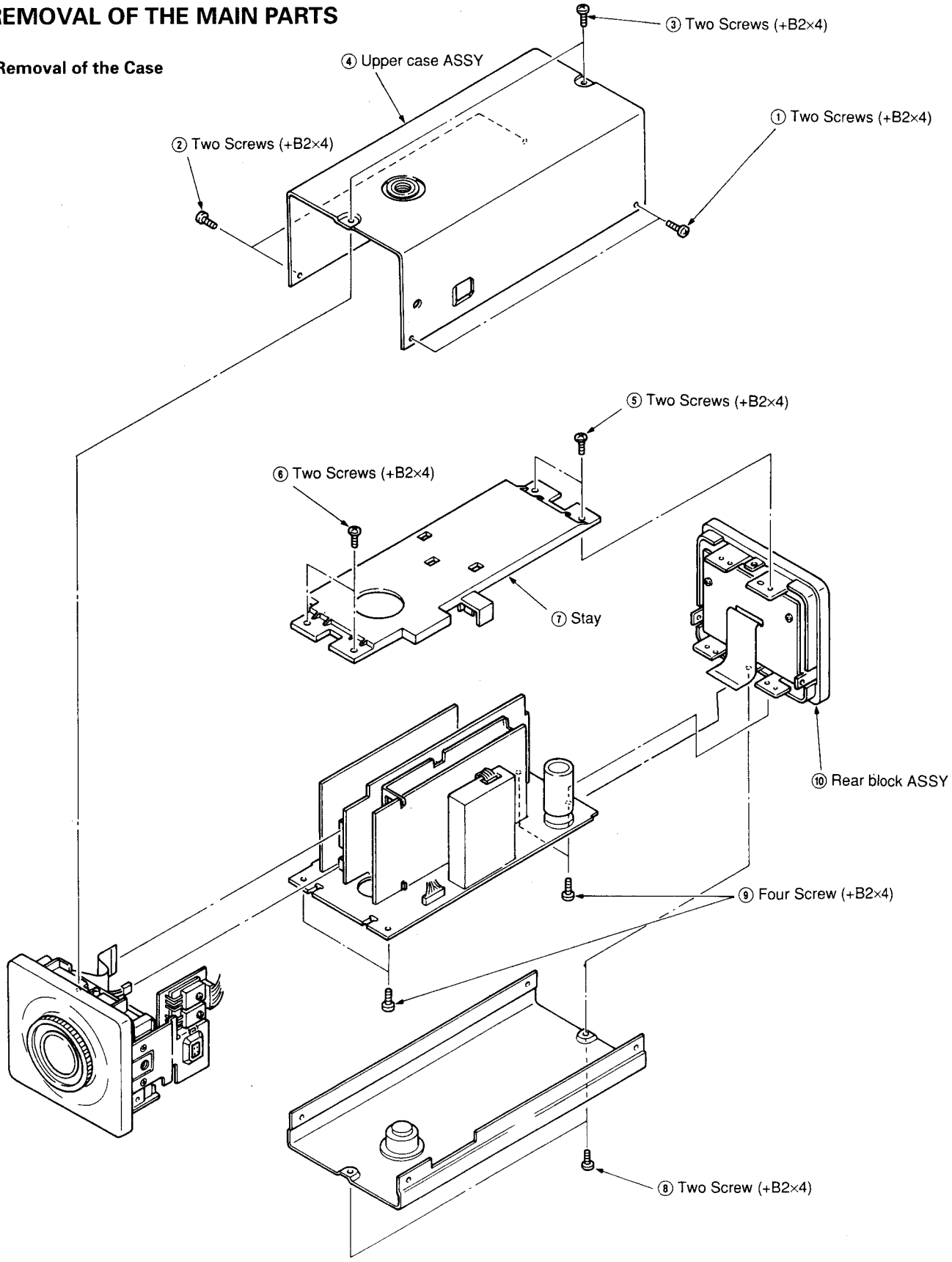
Wavy picture

When shooting stripes, straight lines, or similar patterns, the image on the screen may appear jagged.

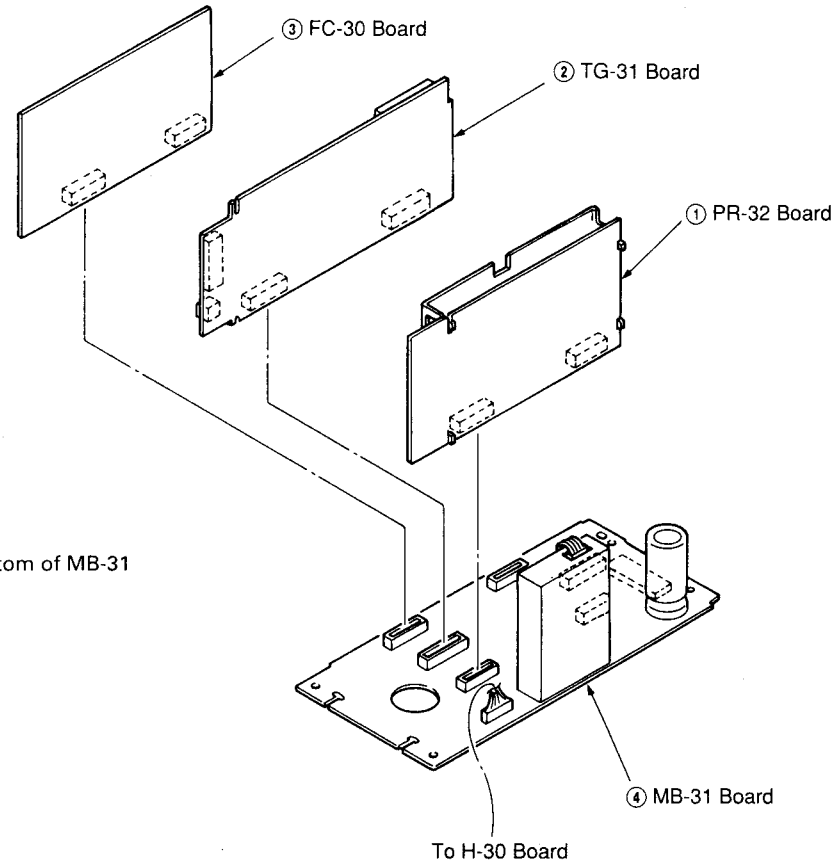
SECTION 2
SERVICE INFORMATION

2-1. REMOVAL OF THE MAIN PARTS

2-1-1. Removal of the Case

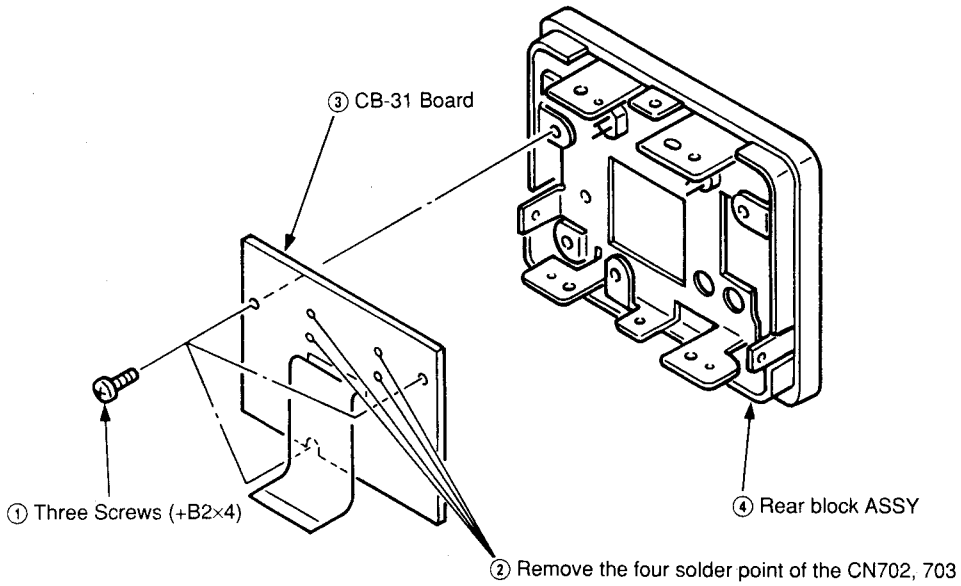


2-1-2. Removal of the PR-32, TG-31, FC-30 Boards

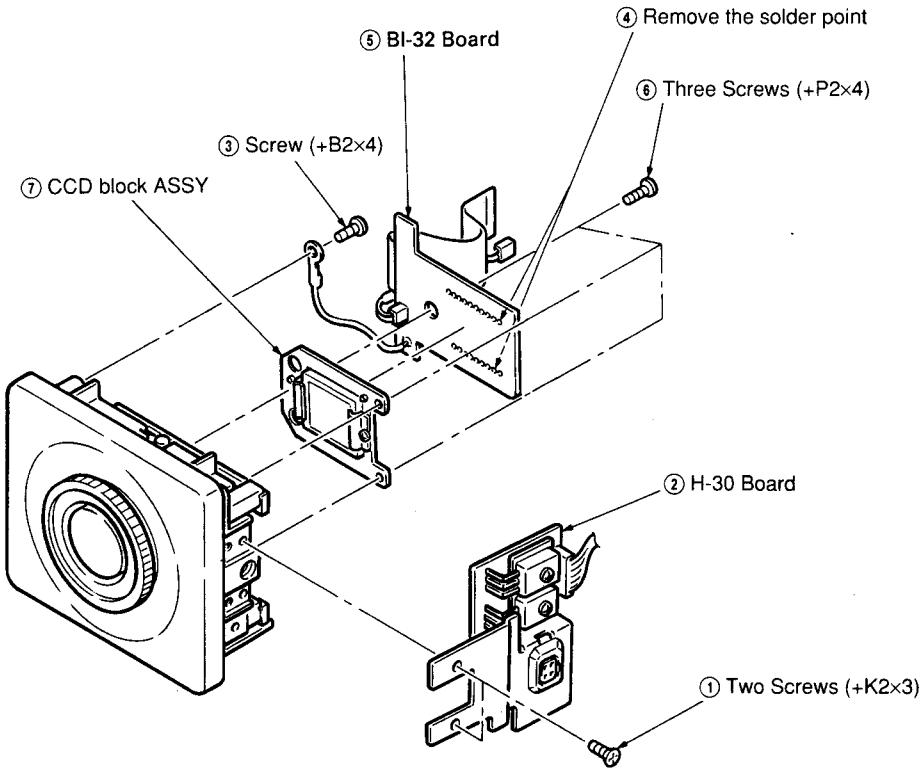


Note:
When mounting, hold the bottom of MB-31 board and securely insert it.

2-1-3. Removal of the CB-31 Board

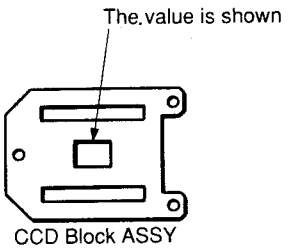


2-1-4. Removal of the CCD Block Assy

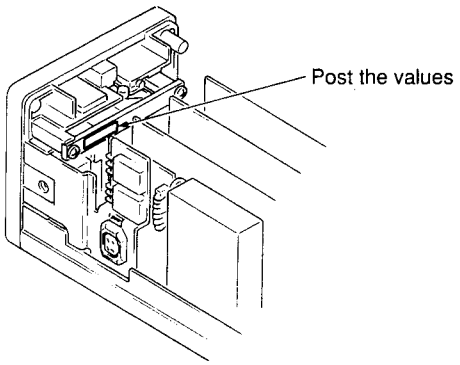


2-2. REPLACEMENT OF CCD BLOCK

Each CCD's own values of the VSUB is required for the adjustment. This value is shown at the back of the CCD imager.



Post the values to the front block ASSY before soldering the BI-32 board on the CCD block ASSY.



The factory-set values of the CCD imager are pasted in the front block ASSY in the same way.

SECTION 3
THEORY OF OPERATION

3-1. BI-32 BOARD

The BI-32 board has the CCD imager which changes light into electric signals. On the CCD chip, 411988 [473820] photosensors are arranged in 811 [795] horizontally and 508 [596] vertically. Among them, 379392 [437664] are effective picture elements arranged in 768 [752] horizontally and 494 [582] vertically.

The incident ray is converted into charge according to the light intensity in the photosensor block, read from the photosensors to the transfer block, and transferred successively to the output block.

The transfer block has two parts; the vertical transfer block and the horizontal transfer block.
The charge converted by the photosensors is transferred for every field to the vertical block next to each photosensor. The charge which is transferred to each vertical transfer block is transferred in a vertical direction in the vertical transfer block V1,V2,V3 and V4, and transferred to the progressive horizontal transfer block.
The horizontal transfer block transfers the charge in the horizontal transfer clock H1 and H2 in a horizontal direction to the output block.

The condenser in the output block converts the charge into the voltage signal, and the signal is output from the IC101. Then it goes through the Q101 buffer and is transferred to the TG-31 board.

Note: The figures in [ ] show the SSC-M370CE.

3-2. TG-31 BOARD

The board has the following blocks.
① Sample and Hold/AGC
② Timing Signal Generation for CCD drive
③ CCD Vertical Transfer Clock Driver
④ SYNC Signal Generation
⑤ VCO for External SYNC
⑥ External SYNC
⑦ External SYNC Horizontal Phase Adjustment
⑧ V SUB Voltage Supply/CCD IRIS Circuit
⑨ IRIS/AGC

① Sample and Hold/AGC
The signal output from the CCD imager is branched into the DATA signal and PG signal, and both undergo sample and hold in each timing and signal separation.
The DATA and PG signals input to the IC401 both undergo sample and hold by the sample and hold pulse XSHP and XSHD. The PG signal undergoes sample and hold three times in the order of XSHP, XSHD and XSHP. The DATA signal undergoes it twice in the order of XSHD and XSHP. The signal separation is executed according to the difference between the DATA and PG signals. The separated signals are input in the AGC amplifier and detected by the detection circuit installed to the IC401 to keep the value reasonable.

② Timing Signal Generator for CCD Drive
Inputting the HD and VD pulses of the 28 MHz basic clock oscillation circuit output and the SYNC signal generator (IC406) makes the IC405 generate the clock, sample and hold, and clamp pulse necessary for CCD drive.

- CL : 28 MHz basic clock ÷2
- H1, H2 : H register drive pulse for CCD imager
- XV1, XV2, XV3, XV4 : V register drive pulse for CCD imager (Output to the BI-32 board through the drive circuit of IC 403 with XSGI and XSG2)
- PG : Pre-charge gate pulse
- CLP1, CLP2, CLP3, CLP4 : Various clamp pulse
- XSHP, XSHD : Pulse for signal separation sample and hold
- XDL1, XDL2 : Pulse for Y signal recomposition sample and hold

The above clock or pulses are output. Also, the charge discard pulse X SUB for shutter speed control is output from this IC.

③ CD Vertical Transfer Clock Driver
Drive the CCD imager Vregister drive pulse. This IC drives the following pulses; XV1, XV2, XV3, XV4, XSG1, XSG2 (all output from the IC405), and the charge discard pulse X SUB.

④ SYNC Signal Generation
Inputting the CL signal makes the IC406 generate the various timing signals necessary for making the video signals.

- SYNC : Composite SYNC signal
- HD, VD : Horizontal or Vertical SYNC signal
- BLK : Blanking signal

⑤ VCO for External Synchronism
The LC-31 board generates the 28 MHz basic clock necessary for external synchronism, and it has the following input and output.

- Oscillation ON/OFF control input
- Oscillation frequency control input
- 28 MHz basic clock output

⑥ External Synchronism
The followings make the signals necessary for external synchronism; Q408, Q409, Q410,Q411, Q413, Q414, IC411, IC412, IC413 and IC415.
The Q408, Q409, Q410, Q411, Q413 and Q414 execute the synchronizing separation of the external SYNC signal, and the IC412 and IC413 produce the VD and HD pulses. The VD pulse resets the SYNC signal generator (IC406), and the HD pulse executes the phase comparison at the HD output of the SYNC signal generator (IC406) and the IC411.
The phase comparison output is smoothed by the LPF and becomes the oscillation frequency control input of the LC-31 board.

⑦ External Synchronism Horizontal Phase Adjustment
The IC412 and IC416 adjust the horizontal phase at external synchronism. The microcomputer on the FC-30 board executes the adjustment operated by the SW701 and SW702 on the CB-31 board.

⑧ V SUB Voltage Supply / CCD IRIS Circuit
This circuit supplies the specified voltage to the overflow drain of the CCD imager. The Q401 and Q402 are regulators whose standard voltage is V SUB control voltage.
The 12 Ch D/A converter (IC504) output on the FC-30 board sets the V SUB control voltage so that the overflow drain voltage of the CCD imager is the standard voltage. The IC408 produces the charge discard pulse for shutter speed control from the CCD IRIS control signal produced by the FC-30 board and from the X SUB signal output by the IC405.

⑨ IRIS/AGC
The output for the IRIS detection is output from the IC401 4 PIN to the H-30 board as the video signal (No SYNC signal).
The circuit centering on the Q405 is the AGC detection circuit, and composes the AGC group with the operational amplifier inside the IC401.

3-3. PR-32 BOARD

The luminance signal (Y output) and the clamp pulse (CLP 3) from the TG-31 board go through the DC restorers of the Q303 and Q304, and the signal undergoes gamma compensation at the Q301, Q302, and IC301 (1/2). The RV301 is a variable resistor for gamma adjustment. Next, they go through the trap circuit of 14 [MHz] (CT301 is a variable capacitor for 14 [MHz] trap adjustment) and IC301 (2/2), and are input to the IC330 (encoder) ㉝ PIN.
Then they go through the delay line FL301 to make the aperture compensation signal, and are input to the ㉟ PIN.
The level of this signal is adjusted by the voltage of the IC330 ㊱ PIN. For a low luminance subject, the voltage of the ㊱ PIN is raised by the AGC CONT voltage to decrease the H aperture compensation signal and noise.
The blanking signal and the sync signal are supplied to the IC330. Also, the voltage of the AGC CONT, Y level (IC330 ㉚ PIN), and the setup (IC330 ㉗ PIN) are in the memory of the IC505/FC-30 board.
The IC330 ㉑ PIN is the output of the composite video signal and is supplied and output to the IC360.

3-4. FC-30 BOARD

This board deal with the function system

① Electronic Shutter/CCD IRIS Circuit
In the electronic shutter circuit, the microcomputer IC505 reads the setting of the SW501 (10 position rotary switch), and outputs the ED0, ED1, ED2 and SMD2 signals to the IC405 on the TG-31 board through the MB-31 board.
In the CCD IRIS circuit, the microcomputer IC505 changes the electronic-shutter speed automatically and successively according to the subject illumination. The IC508, IC509, IC510, Q509 and Q510 produce a saw-tooth wave of 1 field period. On the other hand, the IC505 of TG-31 board produces the shutter-speed-control voltage based on the IRIS signal of the IC401 of TG-31 board. The IC502 compares the both signals, produces the SWND signal whose pulse length accords with the subject illumination, and outputs it to the TG-31 board.

② Microcomputer Circuit

The microcomputer circuit deals with the adjustment of the signal process system in addition to the above ① and ② functions.
The IC504 is the 12Ch D/A converters (Electronic volumes), and output the 12Ch analog voltage respectively according to the data set by the IC505. The IC505 is connected with the adjustment fixture by the CN502, then the data specified by the fixture is set into the IC504 through the IC505 so that they output the analog voltage for adjustment.

3-5. MB-31 BOARD

This board has the DC/DC converter which supplies the DC power necessary for each board, the overlay SYNC signal separation circuit, the external SYNC signal selection circuit, and the overlay power supply regulator circuit.
The circuit centering on the Q201 and Q202 is the overlay SYNC signal separation circuit. The signal output from this circuit and the external SYNC signal input from the CN703 on the CB-31 board are sent to the IC201. The IC201 selects the external SYNC signal according to the SW706 on the CB-31 board. The Q203, Q204 and Q603 on the H board compose the regulator of the overlay power supply.
Also, this board functions as a relay board between boards.

3-6. H BOARD

This board has the regulator for the power supply overlay, the power supply regulator and connector for the automatic iris lens.

3-7. CB-31 BOARD

This board has various input or output connectors and control switches.

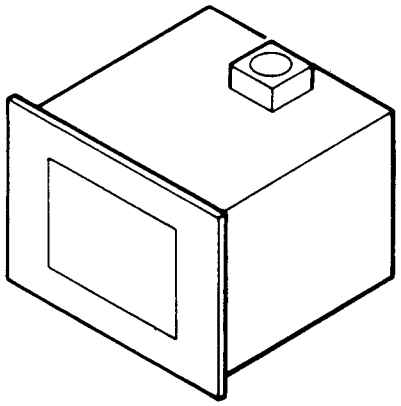
SECTION 4
ADJUSTMENT

4-1. PREPARATION

4-1-1. Adjustment Fixture and Equipment

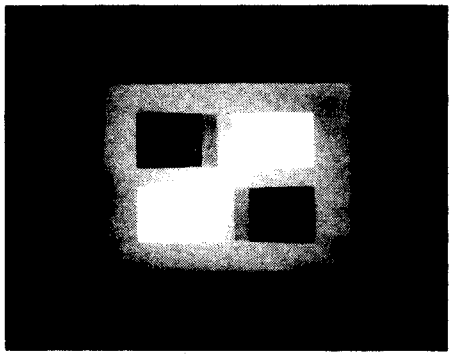
J-6029-140-A	Pattern Box PTB-500

- Light source for test chart AC 90 ~ 240 V



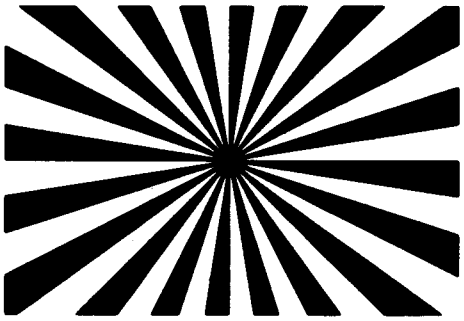
J-6026-130-B	Gray Scale Chart

- For video level and gamma adjustment

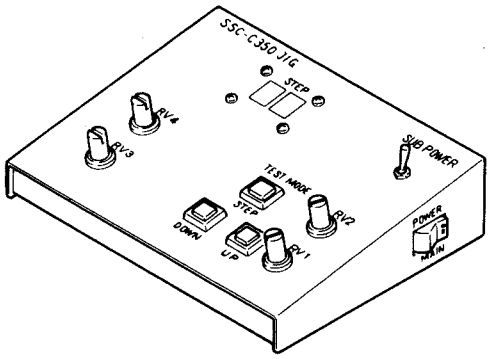


J-6024-340-B	Siemens Star Chart

- For back forcus adjustment

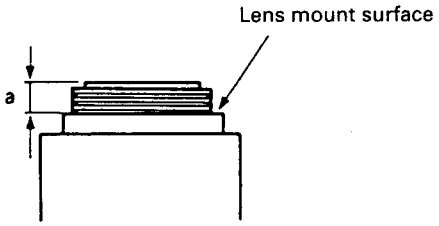


J-6095-340-A	EVR Adjustment Fixture



Commercial measuring equipment and fixture

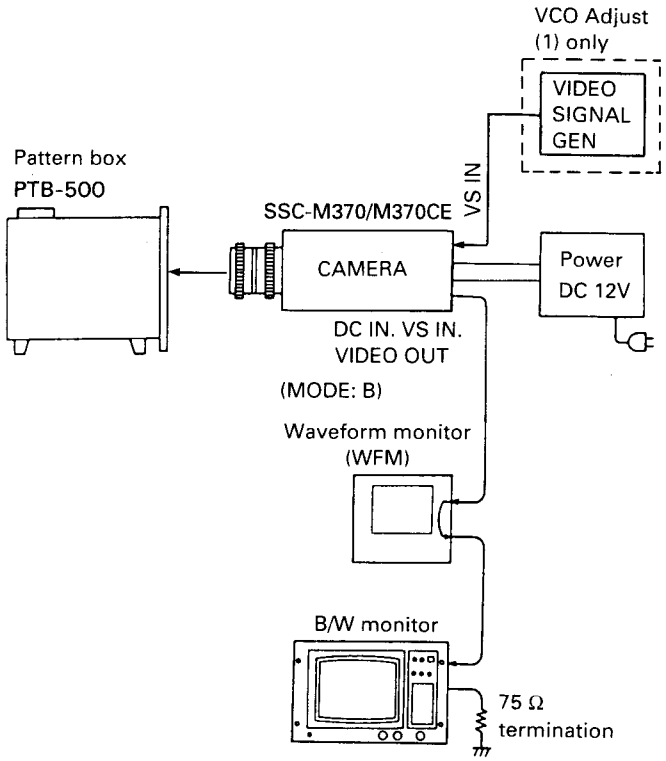
- Dual Trace Oscilloscope
- Waveform Monitor (WFM)
- Digital Voltmeter
- Color Monitor
- Lens (1/2 inch C mount and manual iris type)



a: should be under 9 mm

- ND Filter
  ND 25 (25%) 50 mm Square made by Kenko
  ND 0.3 (0.3%) 50 mm Square made by Kenko

4-1-2. Connection for Adjustment

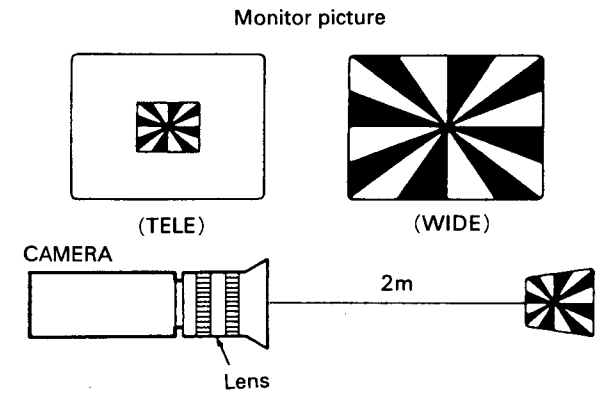


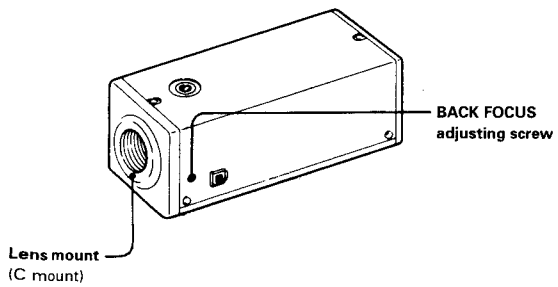
Note:
To adjust exactly, use the manual iris lens of a C mount type.

4-2. MECHANICAL BACK FOCUS ADJUSTMENT

Subject: Siemens Star chart
Lens iris: Open
Equipment: B/W monitor
Test point: VIDEO OUT
Adjust:

1. Set the zoom control at TELE so as to obtain the maximum multiplication factor. Optically focus the image so as to obtain the maximum resolution.
2. Set the zoom control at WIDE so as to obtain the minimum multiplication factor. Do not optically focus the image at this time.
   Check whether the image is focused, on the monitor while turning the zoom control from TELE to WIDE.
   If the image is not focused, properly set at back focus as follows.
3. When the zooming mechanism is set at WIDE, turn the back focus adjusting screw.
4. Repeat step 1 through 3 several times.

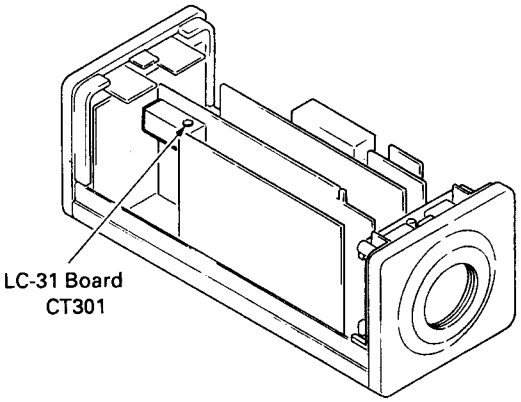




4-3. VCO ADJUSTMENT

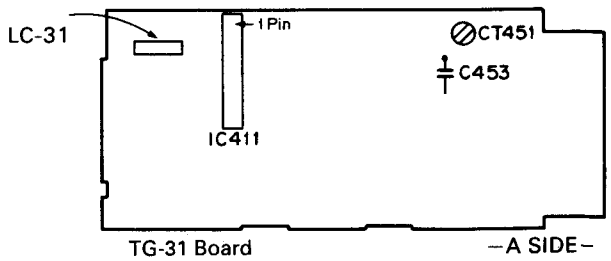
4-3-1. VCO Adjustment (1)

Object: Close 'C'
Equipment: Oscilloscope (DC 500 mV 0.2 μS)
Measurement point: TG-31 Board IC411 1 pin
Adjustment point: LC-31 Board CT801
Specification: 2.9 ±0.1 V
Adjustment method: Perform adjustment after inputting the external sync singnal to the VS IN.



4-3-2. VCO Adjustment (2) [SSC-M370CE only]

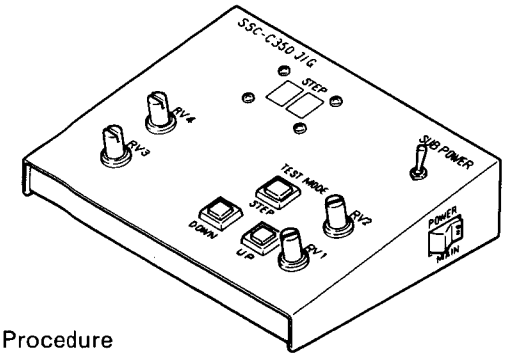
Object: Close 'C'
Equipment: Oscilloscope (DC 500 mV 0.2 μS)
Measurement point: TG-31 Board C453
Adjustment point: TG-31 Board CT451
Specification: 4.1 ±0.1 V
Adjustment method: Remove the FC-30 Board before adjustment



4-4. SIGNAL PROCESS ADJUSTMENT

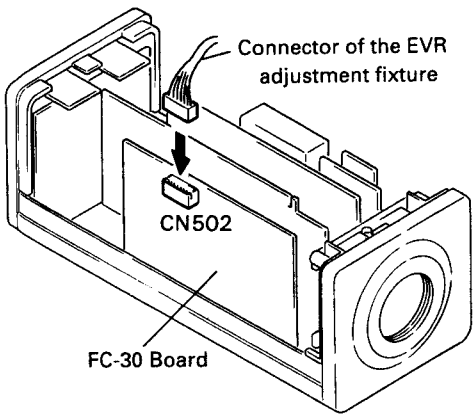
[EVR Adjustment Fixture]

The SSC-M370/M370CE adjusts electricity for signal process by the EVR (Electric volume).
The special EVR adjustment fixture is required for the adjustment. The adjustment data is varied by the fixture, and the values are written into the memory of camera.



- Procedure

1) Set the MAIN POWER and SUB POWER switches of the EVR adjustment fixture to OFF, and connect the connector of the fixture to the CN502 of the FC-30 board.



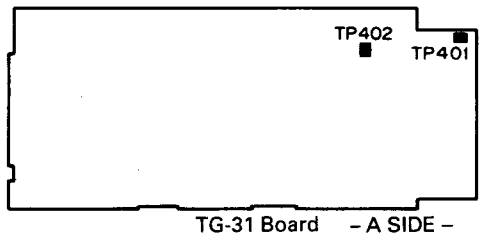
2) Set the MAIN POWER switch of the fixture to ON, and then set the camera power to ON. The STEP value of the fixture becomes "00".

3) Set the SUB POWER switch of the fixture to ON, and the STEP value becomes "01" and the fixture is in the adjustment mode. The STEP value is varied by operating the STEP UP and STEP DOWN buttons. After the value comes to "14", it returns to "01".

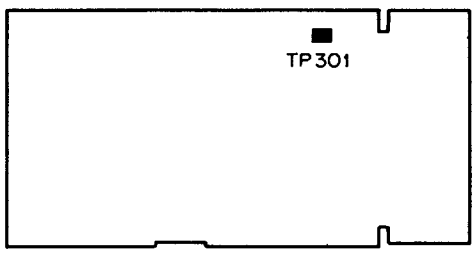
4) The adjustment is executed by operating the RV1 – RV4 with the STEP value in accord with the adjustment item number. During the process, the adjustment data is shown in the STEP indicator in hexadecimal code.

5) By setting the SUB POWER switch to OFF after the adjustment, the adjustment data is written in the camera memory.
The data cannot be written, if the MAIN POWER switch or camera power switch to OFF before SUB POWER switch to OFF.

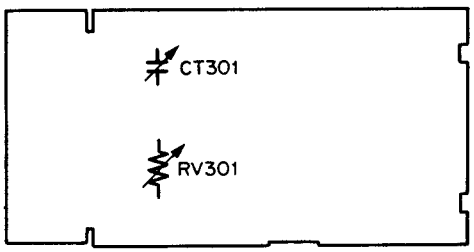
[Adjustment Location]



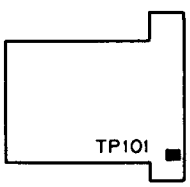
TG-31 Board – A SIDE –



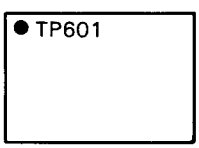
PR-32 Board – A SIDE –



PR-32 Board – B SIDE –



BI-32 Board
– A SIDE –

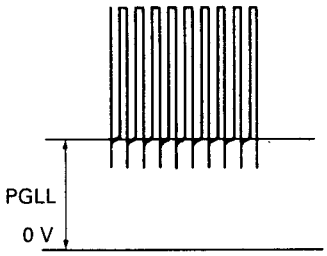


H-30 Board
– A SIDE –

4-4-1. PGLL Adjustment

STEP No.: "01"
Object: Close 'C'
Equipment: Oscilloscope (DC500 mV 0.2 μS)
Measurement point: TG-31 Board TP402
Adjustment point: JIG (RV1)
Specification:Set point ±0.15 V
Adjustment method: Referring to the chart, adjust to the voltage set point in accordance with the mark of the PGLL voltage (left figure of the two) posted on the metallic bar of the front block.(See page 2-4)

*MARK (L)	PGLL (V)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0



*MARK (L):Left figure of the two

4-4-2. VSUB voltage Adjustment

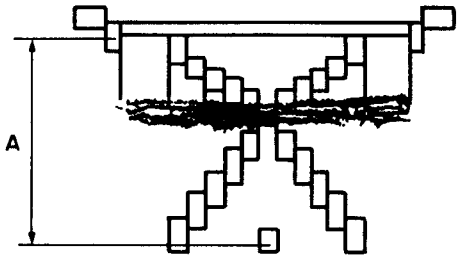
STEP No.: "02"
Object:Close 'C'
Equipment: Oscilloscope (DC 2.0 V 1mS)
Measurement point: TG-31 Board TP401
Adjustment point: JIG (RV1)
Specification:Set point ±0.15 V
Adjustment method: Referring to the chart, adjust to the voltage set point in accordance with the mark of the VSUB voltage (right figure of the two) posted on the metallic bar of the front block. (See page 2-4)

*MARK (R)	VSUB (V)	*MARK (R)	VSUB(V)
A	7.0	N	13.0
B	7.5	P	13.5
C	8.0	Q	14.0
D	8.5	R	14.5
E	9.0	S	15.0
F	9.5	T	15.5
G	10.0	U	16.0
H	10.5	V	16.5
J	11.0	W	17.0
K	11.5	X	17.5
L	12.0	Y	18.0
M	12.5	Z	18.5

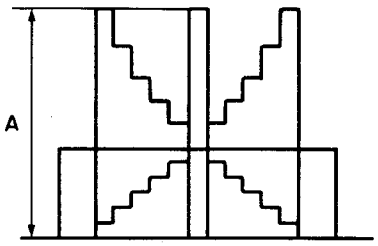
*MARK (R): Right figureof the two

4-4-3. GAIN 0 dB Adjustment

(1)
STEP No.: "03"
Object: Grayscale chart
Equipment: Oscilloscope (AC 50 mV 10 μS)
Measurement point: BI-32 Board CN101 1pin (GND: 2 pin)
Adjustment point: Lens iris
Specification: A=200 ±20 mV

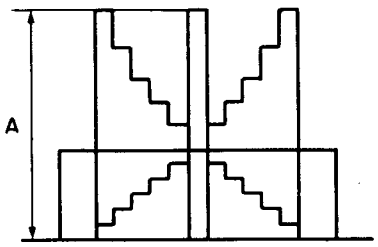


(2)
STEP No.: "03"
Object: Grayscale chart
Equipment: Oscilloscope (AC 100 mV 10 μS)
Measurement point: PR-32 Board TP301
Adjustment point: JIG (RV1)
Specification: A=500 ±30 mV



4-4-4. Auto Iris Video Level Adjustment

STEP No.: "04"
Object: Grayscale chart
Equipment: Oscilloscope (AC 100 mV 10μS)
Measurement point: H-30 Board TP601
Adjustment point: JIG (RV1)
Specification: 700 ±50 mV

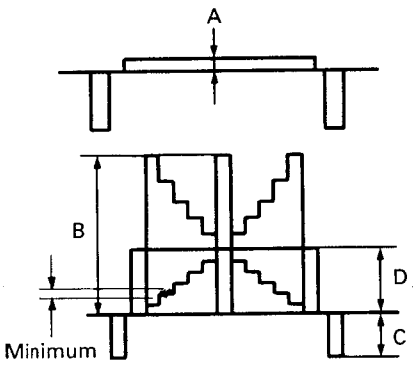


4-4-5. Pedestal Y GAIN Adjustment

STEP No.: "07"
Object: Grayscale chart
Equipment: Waveform monitor
Adjustment point: JIG (RV1/RV2)
Measurement point: VIDEO OUT
Adjustment method:

Adjust the levels covering the front block with something (for example, a black cloth) to protect the CCD device from a light leak.

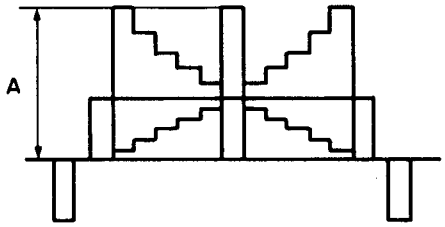
1) Put the lens cap over the lens. (Do not move the iris.)
2) Adjust the RV2 so that the pedestal level equals the adjustment value A.
3) Remove the lens cap from the lens.
4) Adjust the RV1 so that the white level equals the adjustment value B.
5) Make certain that the SYNC and gamma levels are in the range of C and D respectively.
   When the gamma level is outside the range D, adjust the RV301/PR-32 board (Side B).
6) Adjust the CT301/PR-32 board (Side B) to minimize the carrier amplitude of the wave form.



[EIA]	[CCIR]
A = 7.0 ± 0.5 IRE	A = 29 ±10 mV
B = 100 ± 2 IRE	B = 700 ±15 mV
C = 40 ± 4 IRE	C = 300 ± 30 mV
D = 50 ± 5 IRE	D = 350 ± 35 mV

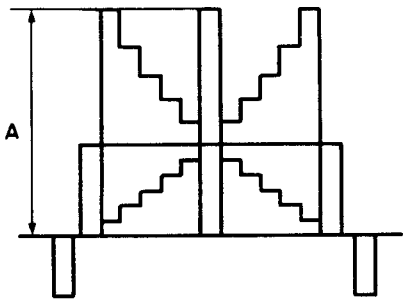
4-4-6. AGC MAX Adjustment

STEP No.: "08"
Object: Grayscale chart
Equipment: Waveform monitor
Adjustment point: JIG (RV1)
Measurement point: VIDEO OUT
Specification: A = 30 ± 2 IRE [EIA]
A = 210 ± 15 mV [CCIR]
Adjustment method: Adjust the levels covering the front block with something (for example, a black cloth) to protect the CCD device from a light leak.
Install the ND filter (0.3%) to the lens before adjustment.



4-4-7. AGC Set Adjustment

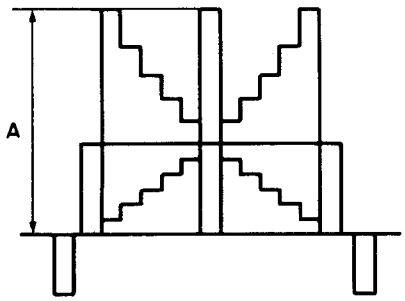
STEP No.: "09"
Object: Grayscale chart
Equipment: Waveform monitor
Adjustment point: JIG (RV1)
Measurement point: VIDEO OUT
Specification: A = 90 ± 5 IRE [EIA]
A = 630 ± 35 mV [CCIR]
Adjustment method: Install the ND filter (25%) to the lens before adjustment.



4-4-8. CCD IRIS Level Adjustment

STEP No.: "10"
Object: Grayscale chart
Equipment: Waveform monitor
Adjustment point: JIG (RV1)
Measurement point: VIDEO OUT
Specification: A = 95 ± 5 IRE [EIA]
A = 665 ± 35 mV [CCIR]
Adjustment method:

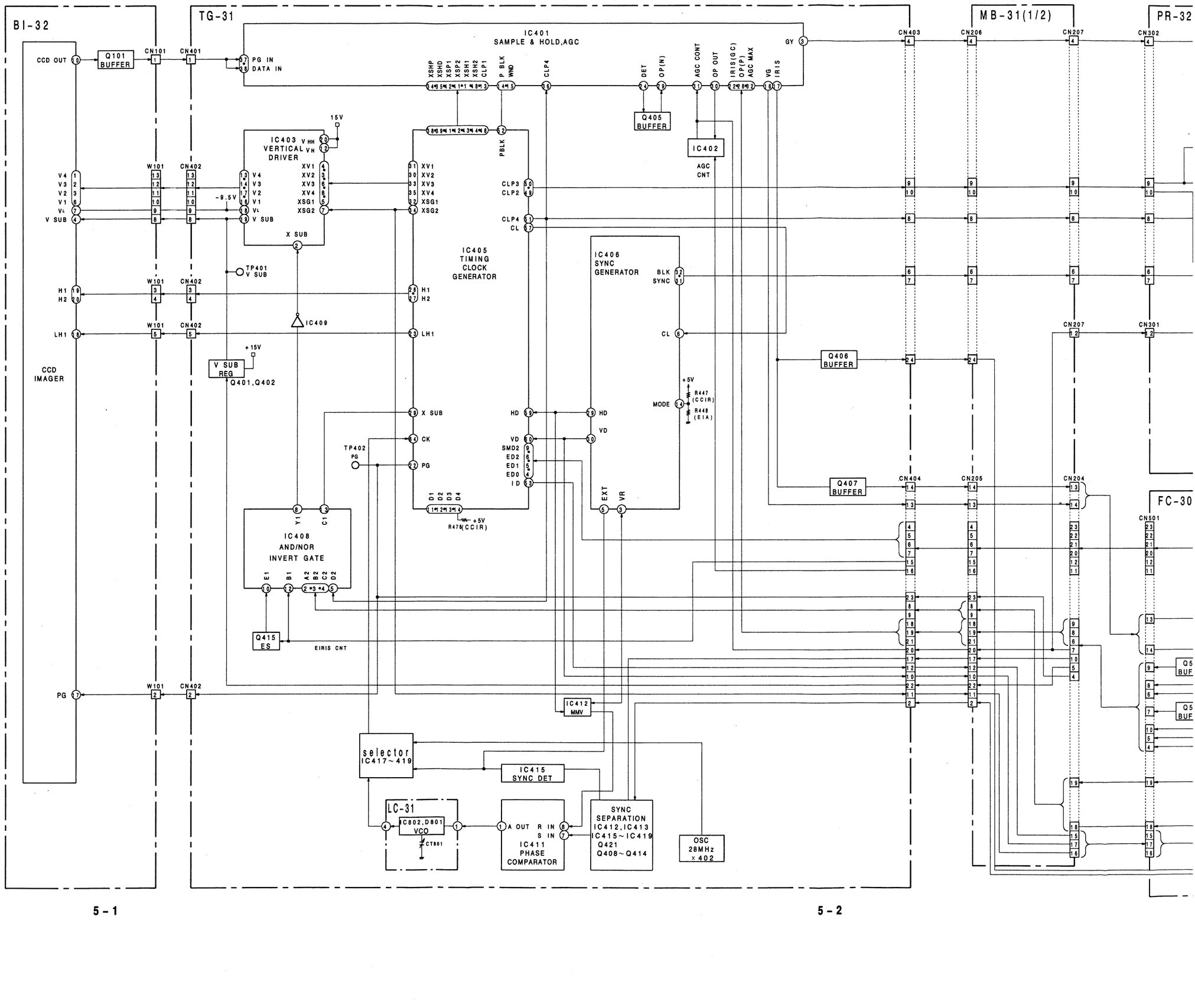
1) Set the lens iris to OPEN.
2) Turn the RV1 clockwise to the full, then gradually turn it back counterclockwise adjusting the white level to A.
3) Cover the lens with hands for a second, then take the hands off and make sure that the video white level is in the range of A.



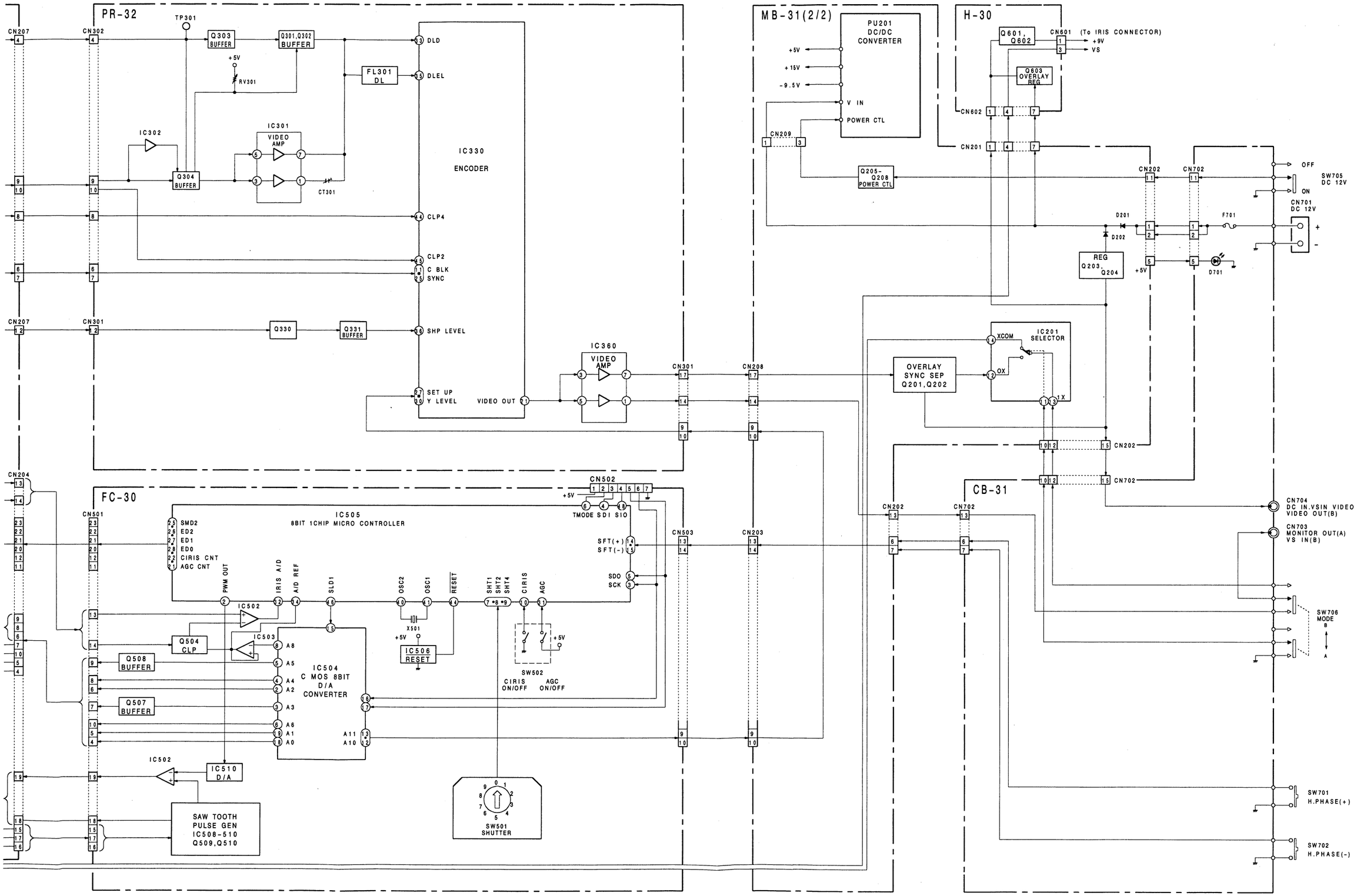
After adjustment, set the SUB POWER switch of the adjustment fixture to OFF.

SECTION 5.DIAGRAMS

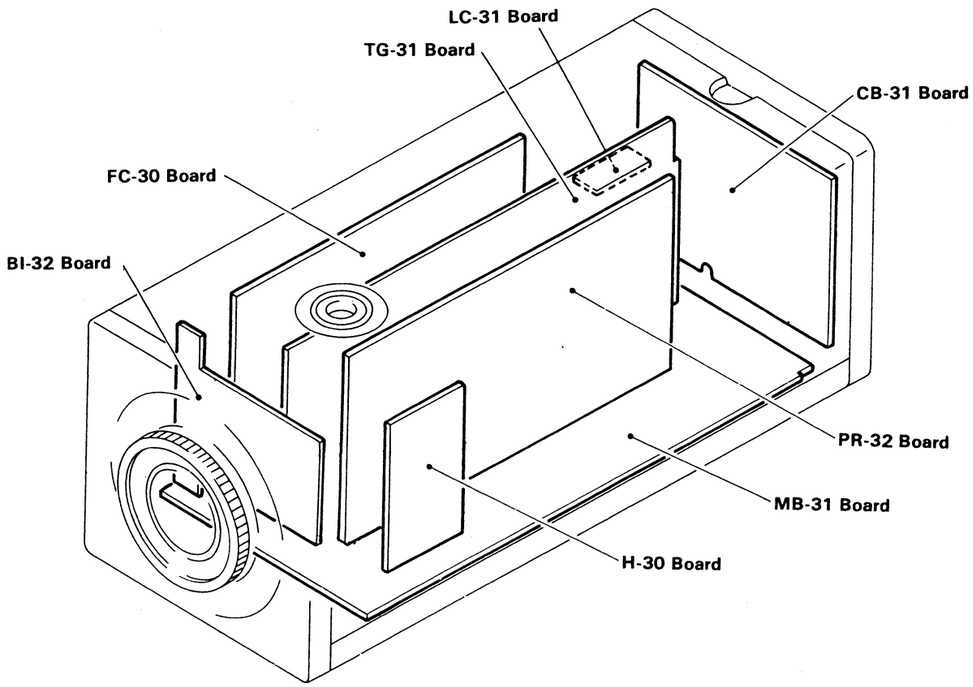
5-1.BLOCK DIAGRAMS



5-1 5-2


PR-32
TP301
CN207
CN302
Q303 BUFFER
Q301,0302 BUFFER
+5V
RV301
FL301 DL
DLD
DLEL
IC302
IC301
VIDEO AMP
Q304 BUFFER
CT301
IC330
ENCODER
CLP4
CLP2
C BLK
SYNC
CN301
Q330
Q331 BUFFER
SHP LEVEL
SET UP
Y LEVEL
VIDEO OUT
IC360
VIDEO AMP
CN208
MB-31(2/2)
PU201
DC/DC CONVERTER
+5V
+15V
-9.5V
V IN
POWER CTL
CN209
Q205-Q208 POWER CTL
H-30
Q601, Q602
CN601
(To IRIS CONNECTOR)
+9V
VS
Q603 OVERLAY REG
CN602
CN201
CN202
CN702
OFF
ON
SW705 DC 12V
CN701 DC 12V
D201
D202
F701
D701
REG Q203, Q204
+5V
IC201 SELECTOR
XCOM
OX
1X
OVERLAY SYNC SEP Q201,Q202
CN202
CN702
CB-31
CN704 DC IN.VSIN VIDEO OUT(A) VIDEO OUT(B)
CN703 MONITOR OUT(A) VS IN(B)
SW706 MODE B A
SW701 H.PHASE(+)
SW702 H.PHASE(-)
CN204
FC-30
CN501
CN502
+5V
TMODE SDI SIO
IC505
8BIT 1CHIP MICRO CONTROLLER
SMD2
ED2
ED1
ED0
CIRIS CNT
AGC CNT
PWM OUT
IRIS A/D
A/D REF
SLD1
OSC2
OSC1
RESET
SHT1
SHT2
SHT4
CIRIS
AGC
SFT(+)
SFT(-)
SDO
SCK
CN503
CN203
IC502
IC503
Q504 CLP
Q508 BUFFER
Q507 BUFFER
IC504
C MOS 8BIT D/A CONVERTER
A8
A5
A4
A2
A3
A6
A1
A0
A11
A10
X501
IC506 RESET
SW502
CIRIS ON/OFF
AGC ON/OFF
IC510 D/A
SAW TOOTH PULSE GEN IC508-510 Q509,Q510
SW501 SHUTTER

5-2. BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED CIRCUIT BOARDS

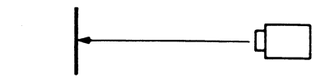
⚠および▒▒印の部品は，安全性を維持するために，重要な部品です。従って交換時は，必ず指定の部品を使用して下さい。

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number sprcified.

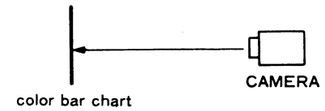
・抵抗で指示のないものは1/10W，単位はすべてΩ。
kΩ：1000Ω，MΩ：1000kΩ
・ケミタン，タンタルを除くコンデンサーで，耐圧50V以下のものは，その耐圧を省略。単位はすべてμF(pはpF)。
・電圧値は対アース間の参考値。
（使用テスター：10MΩデジタルマルチメーター）。
・回路図上に表記された赤丸数字は，波形図のリファレンスNo.です。
・➡は，信号ライン。
・——は，GNDライン。

Note:
- All resistors are in ohms, 1/10 W unless otherwise noted. kΩ = 1000 Ω, MΩ = 1000 kΩ
- All capacitors are in μF unless otherwise noted. p: μμF 50 V or less are not indicated except for electrolytic and tantalums.
- Readings are taken with a 10 MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- —: B + bus.
- ➡: signal path.
- **—: GND**

・波形図の測定条件

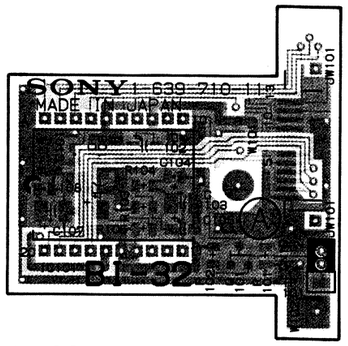


・Waveforms are measured in condition below.

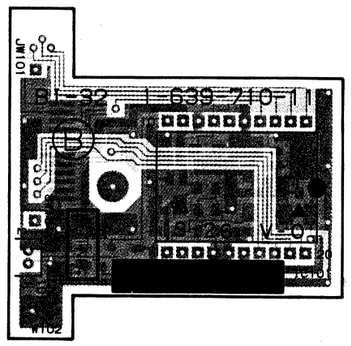


LC-
-(A)
1-636

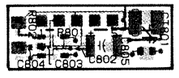
BI-32
-(A)SIDE-
1-639-710-11



BI-32
-(B)SIDE-
1-639-710-11

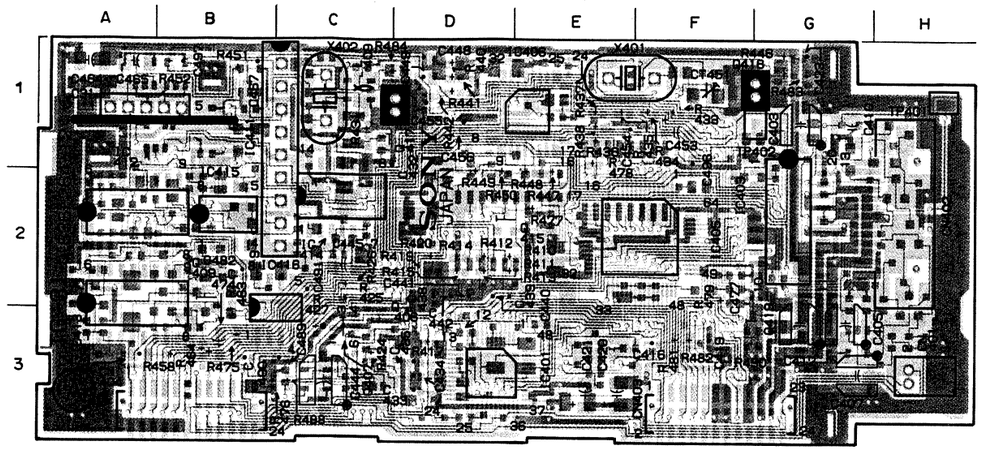


LC-31
-(A)SIDE-
1-636-417-11



LC-31
-(B)SIDE-
1-636-417-11

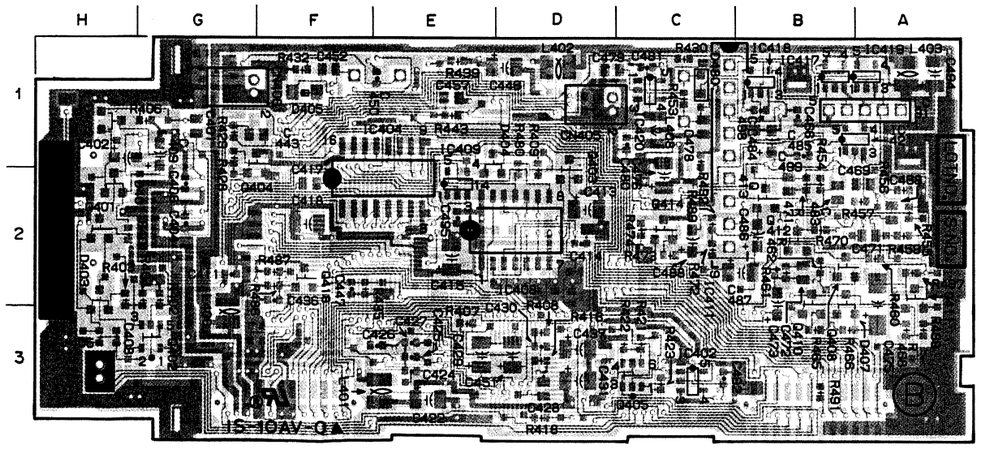
TG-31
-(A)SIDE-
1-636-264-12



IC	
IC401	E-3
IC403	F-2
IC405	F-2
IC406	D-1
IC411	B-1
IC412	A-1
IC413	A-3
IC414	C-2
IC415	B-2
IC416	B-2

TRANSISTOR	
Q406	D-2
Q407	C-3
Q409	B-2
Q415	E-2
Q416	F-1
Q417	C-1
Q419	G-3

TG-31
-(B)SIDE-
1-636-264-12

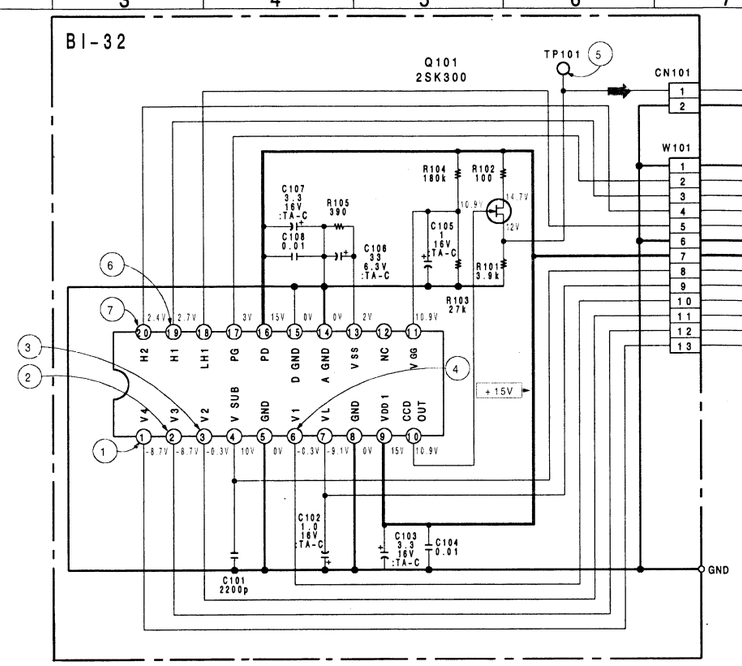


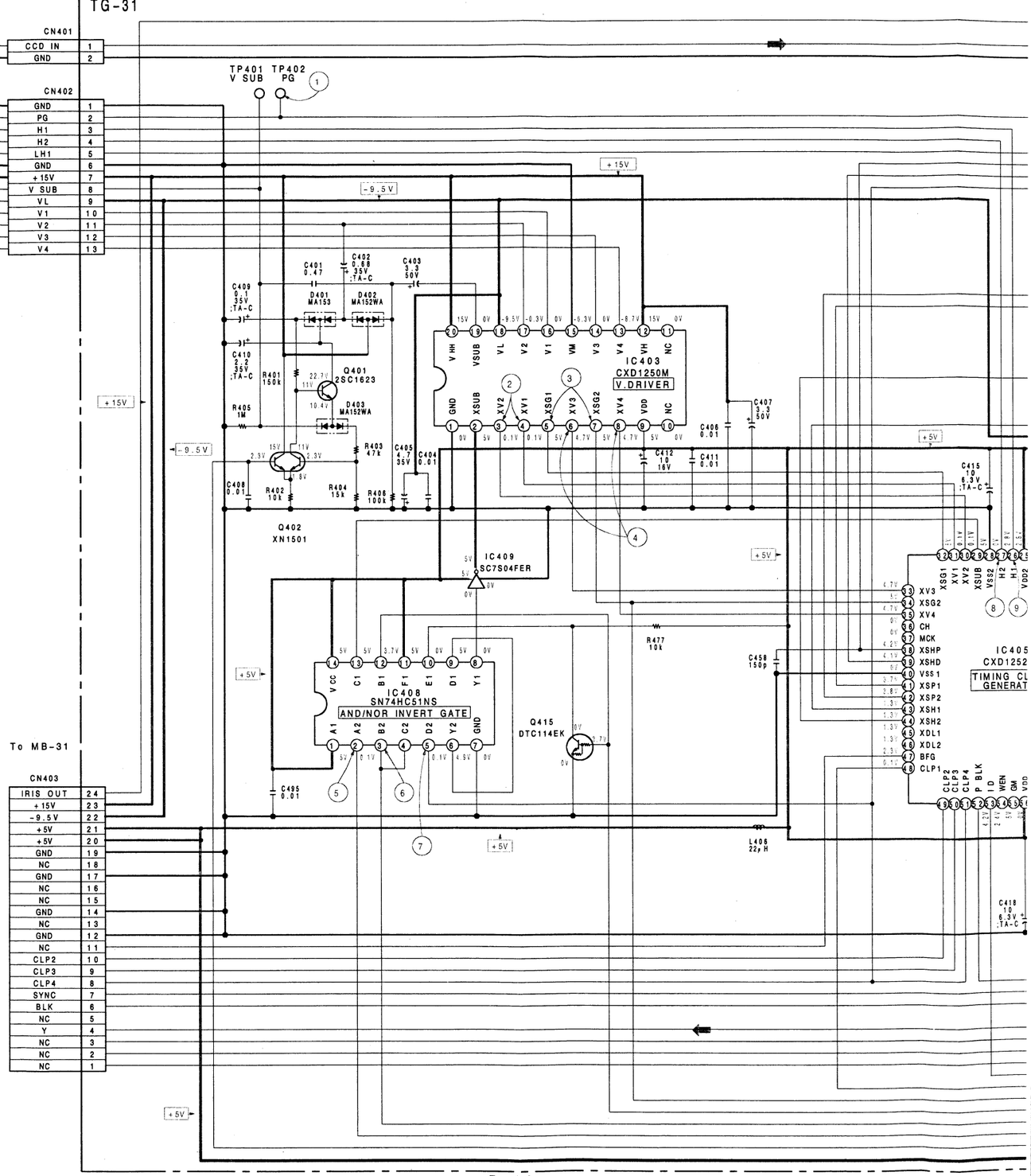
IC	
IC402	C-3
IC404	F-1
IC408	D-2
IC409	E-1
IC411	C-2
IC417	B-1
IC418	B-1
IC419	A-1
IC420	C-1
IC421	A-1

DIODE	
D401	H-2
D402	H-1
D403	H-2
D404	D-1
D407	B-3
D480	C-1

TRANSISTOR	
Q401	H-2
Q402	G-3
Q403	D-1
Q404	G-2
Q405	C-3
Q408	B-2
Q410	B-2
Q411	A-2
Q412	B-2
Q413	B-2
Q414	C-2
Q418	F-2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15





Waveform –BI-32–

① 9Vp-p	② 24.0Vp-p
③ 9Vp-p	④ 24.0Vp-p
⑤ 0.8Vp-p	⑥ 11.1Vp-p
⑦ 5.0Vp-p	

Waveform –TG-31(1/2)–

① 5.0Vp-p	② 5.0Vp-p	③ 5.0Vp-p
④ 5.0Vp-p	⑤ 5.0Vp-p	⑥ 5.0Vp-p
⑦ 5.0Vp-p	⑧ 5.0Vp-p	⑨ 5.0Vp-p
⑩ 5.0Vp-p	⑪ 5.0Vp-p	⑫ 5.0Vp-p
⑬ 0.9Vp-p	⑭ 0.9Vp-p	⑮ 0.9Vp-p
⑯ 1.5Vp-p	⑰ 5.0Vp-p	

SSC-M370/M370CE

TG-31

CN101 / CN401

1		CCD IN	1
2		GND	2

W101 / CN402

1		GND	1
2		PG	2
3		H1	3
4		H2	4
5		LH1	5
6		GND	6
7		+15V	7
8		V SUB	8
9		VL	9
10		V1	10
11		V2	11
12		V3	12
13		V4	13

TP401 V SUB TP402 PG

IC403 CXD1250M V.DRIVER

IC401 CXA1390AR SAMPLE&HOLD AGC

IC409 SC7S04FER

IC408 SN74HC51NS AND/NOR INVERT GATE

IC405 CXD1252AR TIMING CLOCK GENERATOR

Q401 2SC1623

Q402 XN1501

Q415 DTC114EK

Q418 2SA812

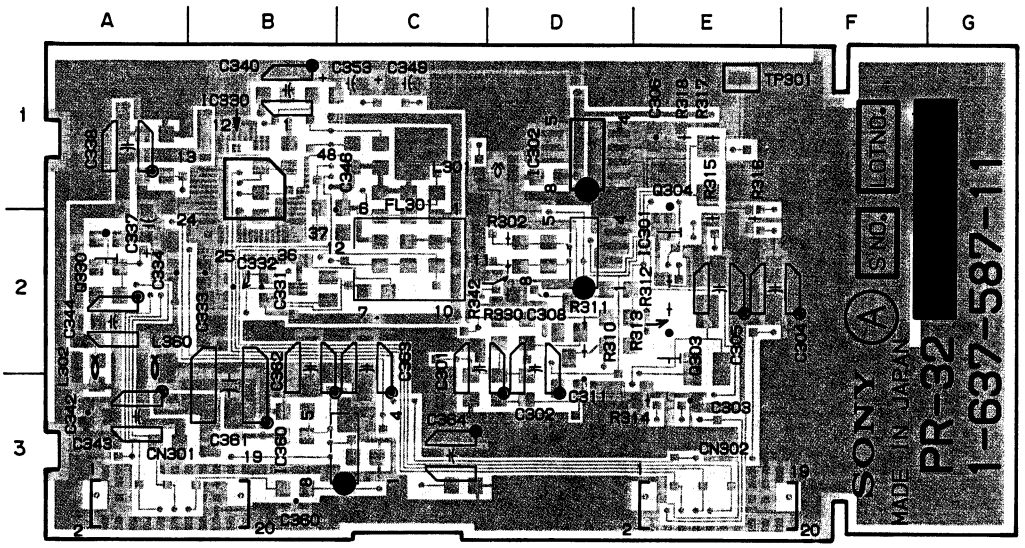
To MB-31

CN403

IRIS OUT	24		
+15V	23		
-9.5V	22		
+5V	21		
+5V	20		
GND	19		
NC	18		
GND	17		
NC	16		
NC	15		
GND	14		
NC	13		
GND	12		
NC	11		
CLP2	10		
CLP3	9		
CLP4	8		
SYNC	7		
BLK	6		
NC	5		
Y	4		
NC	3		
NC	2		
NC	1		

IRIS IN, +5V, IRIS GC, VG OUT, AGC MAX, 0dB, OP OUT, PG, OP IN N, AGC SET, DET OUT, +5V, IRIS OUT, +5V, +5V, L401 22μH, CK, VD, HD, GND, ED2, ED1, ED0, SYNC, BLK, CL OUT, SMD2, ID, XSG2, CIRIS ON/OFF, SWND, V BLK, V SUB, +5V

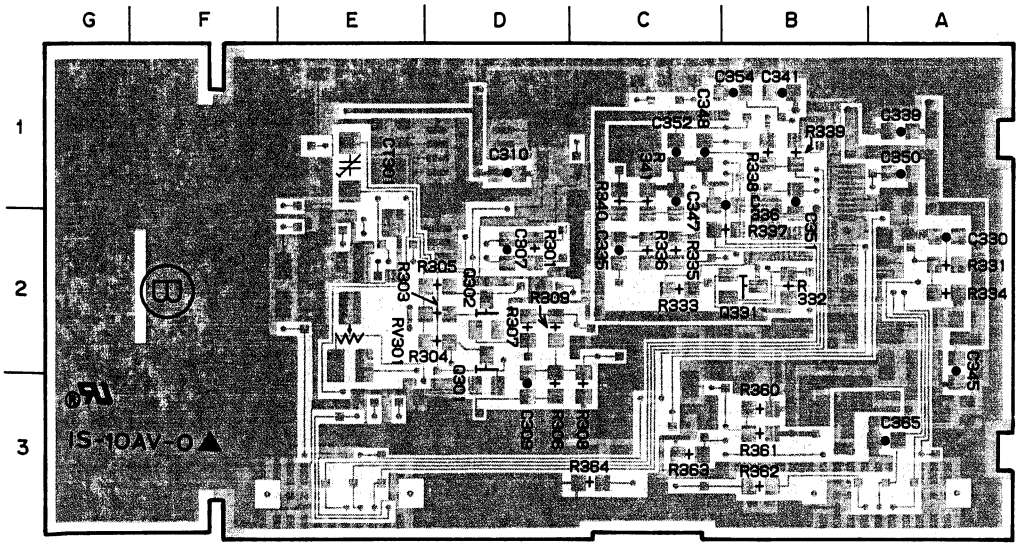
PR-32
-(A)SIDE-
1-637-587-11,12



IC	
IC301	E-2
IC302	B-2
IC330	B-1
IC360	B-3

TRANSISTOR	
Q303	E-2
Q304	E-1
Q330	A-2

PR-32
-(B)SIDE-
1-637-587-11,12



TRANSISTOR	
Q301	D-2
Q302	D-2
Q331	B-2

PR-32 BOARD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

PR-32

To MB-31

CN302

NC	20
GND	19
NC	18
GND	17
NC	16
NC	15
GND	14
NC	13
GND	12
NC	11
CLP2	10
CLP3	9
CLP4	8
SYNC	7
BLK	6
NC	5
Y	4
NC	3
NC	2
NC	1

TP301

Q303 XN4601

Q304 XN4601

IC301(1/2) MC14577AF

Q301 2SC2757

Q302 2SC2757

RV301 r CORRECTION

CT301 14MHz TRAP

IC301(2/2) MC14577AF

Q330 XN1501

Q331 2SA812

FL301 DL

IC302 μPC358G2

IC330 CXA1392R

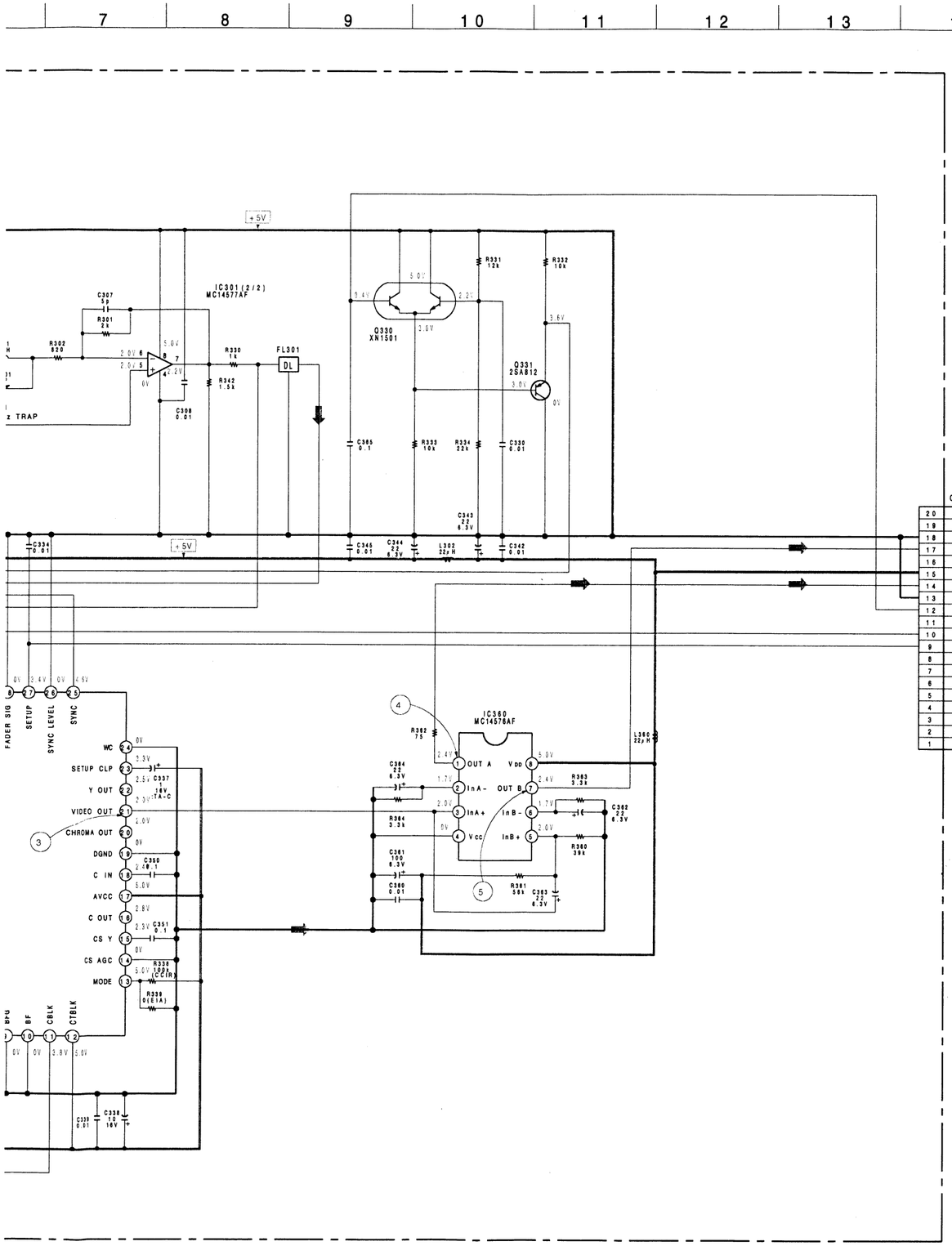
IC360 MC14576AF

To MB-31

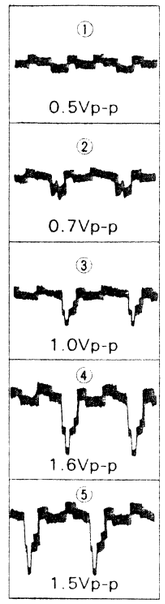
CN301

20	NC
19	NC
18	GND
17	VIDEO 2
16	NC
15	+5V
14	VIDEO 1
13	GND
12	AGC CONT
11	NC
10	Y LEVEL
9	SET UP
8	NC
7	NC
6	NC
5	NC
4	NC
3	NC
2	NC
1	NC

SSC-M370/M370CE



Waveform –PR-32–



FC-30

To MB-31

CN501

NC	1
NC	2
NC	3
PG-LL	4
V-SUB	5
AGC MAX	6
O dB	7
IRIS GC	8
AGC SET	9
V SHIFT	10
AGC ON/OFF	11
EIRIS ON/OFF	12
IRIS	13
VG OUT	14
ID	15
XSG 2	16
VD	17
V BLK	18
SWND	19
ED0	20
ED1	21
ED2	22
SMD2	23
GND	24

Q507 XN4601
Q508 XN4601
Q504 XN4601
Q510 2SA812
Q509 2SC1623

IC502 μPC393G2 (1/2)
IC503 μPC393G2
IC504 MB88341PFV
IC505 SC406672FU
IC506 S-8054ALB-M
IC507 SC7S04FER
IC508 MC74HC74AF
IC509 MC74HC74AF
IC510(1/4) μPC324G2
IC510(2/4) μPC324G2
IC510(3/4) μPC324G2

D501 MA151WA
D502 MA151WA
D503 MA151W

X501

SW501

+5V

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

IC505 SC406672FU

IC502 μPC393G2

IC503 μPC393G2

IC506 S-8054ALB

IC507 SC7S04FER

IC508 MC74HC74AF

IC509 MC74HC74AF

IC510(1/4) μPC324G2

IC510(2/4) μPC324G2

IC510(3/4) μPC324G2

IC510 (4/4) μPC324G2

IC502(2/2) μPC393G2

Q504 XN4601

Q510 2SA812

Q509 2SC1623

D501 MA151WA

D502 MA151WA

D503 MA151WA

X501

SW501

SW502

(For Adjustment)

CN502

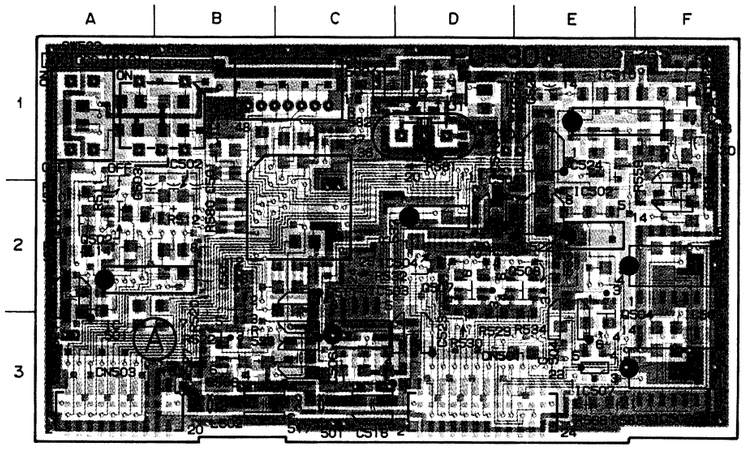
1	+5V
2	TMODE
3	SDI
4	SIO
5	SDO
6	SCK
7	GND

To MB-31

CN503

1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	NC
8	NC
9	SET UP
10	Y LEVEL
11	NC
12	NC
13	SHT(+)
14	SHT(-)
15	GND
16	GND
17	+5V
18	+5V
19	NC
20	NC

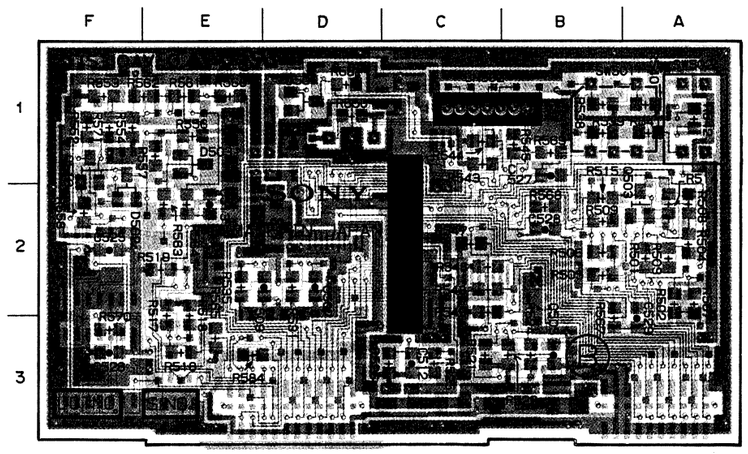
FC-30
-(A)SIDE-
1-636-265-12



IC	
IC501	A-3
IC502	E-2
IC503	C-2
IC504	C-2
IC505	B-1
IC506	D-1
IC507	E-3
IC508	F-3
IC509	F-3
IC510	E-1

TRANSISTOR	
Q501	A-2
Q502	A-2
Q504	E-3
Q505	B-2
Q506	B-3
Q507	D-2
Q508	E-2
Q509	F-1

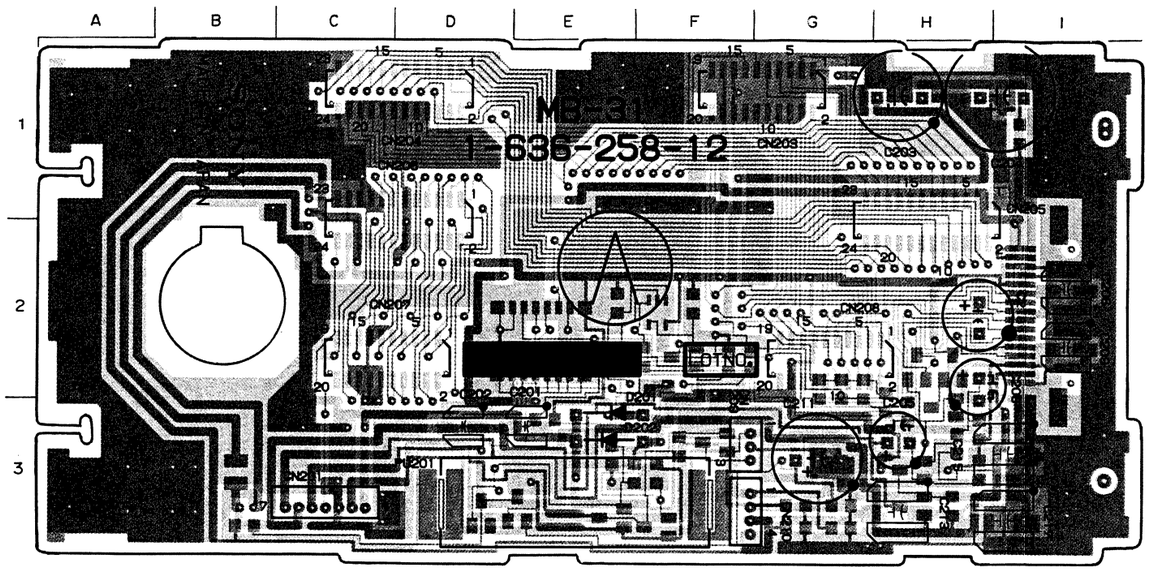
FC-30
-(B)SIDE-
1-636-265-12



TRANSISTOR	
Q503	A-2
Q510	F-1

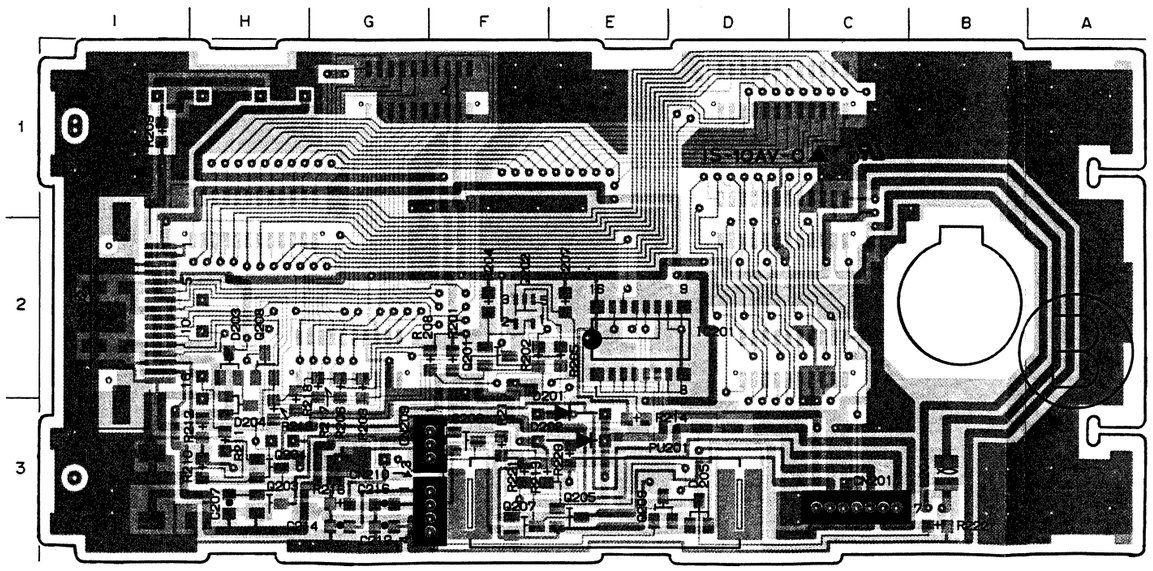
DIODE	
D501	D-1
D502	F-2
D503	E-1

MB-31
-(A)SIDE-
1-636-258-12



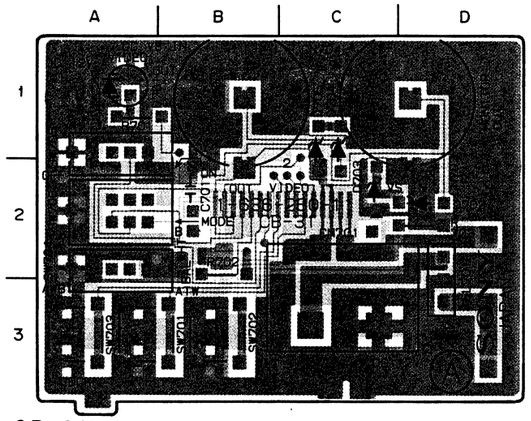
DIODE	
D201	E-3
D202	E-3

MB-31
-(B)SIDE-
1-636-258-12



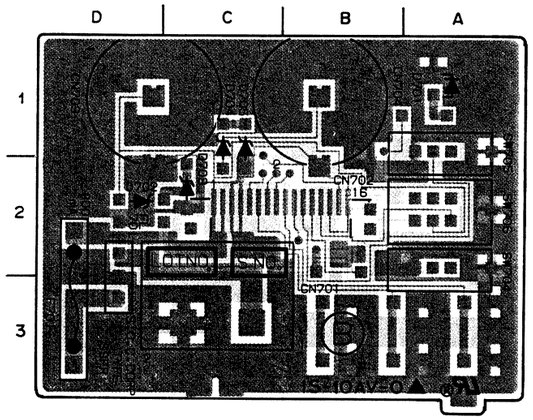
IC	
IC201	D-2
TRANSISTOR	
Q201	F-2
Q202	F-2
Q203	H-3
Q204	H-3
Q205	E-3
Q206	F-3
Q207	F-3
Q208	H-2
Q209	E-3
DIODE	
D201	F-2
D202	F-3
D203	H-2
D204	H-3
D205	D-3

CB-31
-(A)SIDE-
1-636-260-11



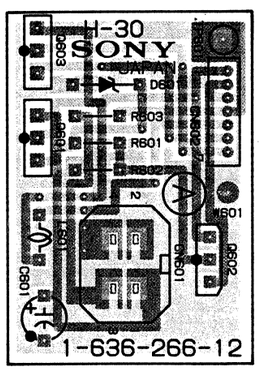
DIODE	
D701	A-1
D702	D-2
D703	C-2
D704	C-1
D705	C-1

CB-31
-(B)SIDE-
1-636-260-11

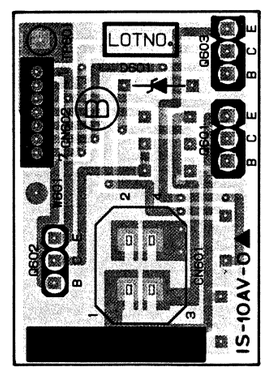


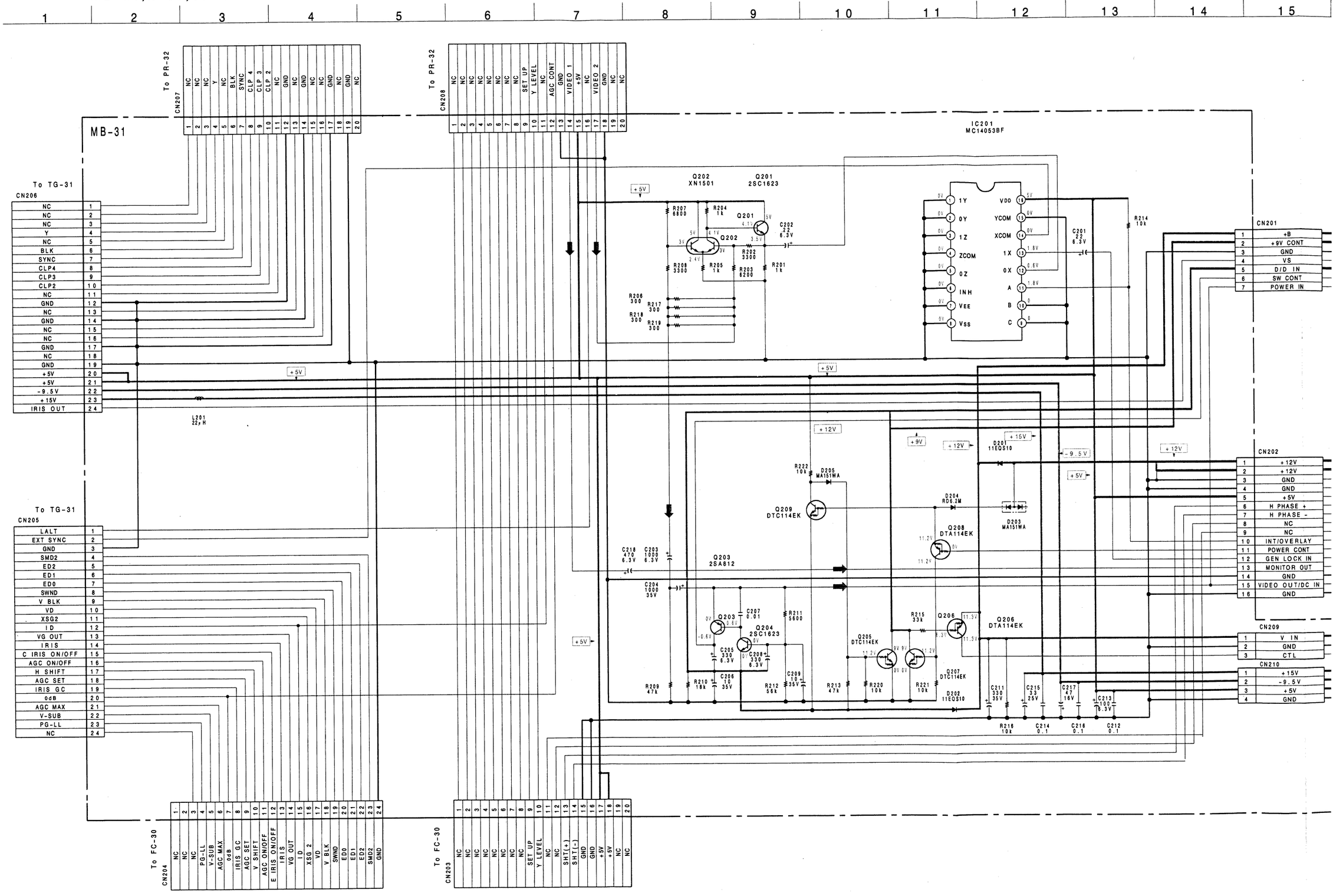
DIODE	
D701	A-1
D702	D-2
D703	C-2
D704	C-1
D705	C-1

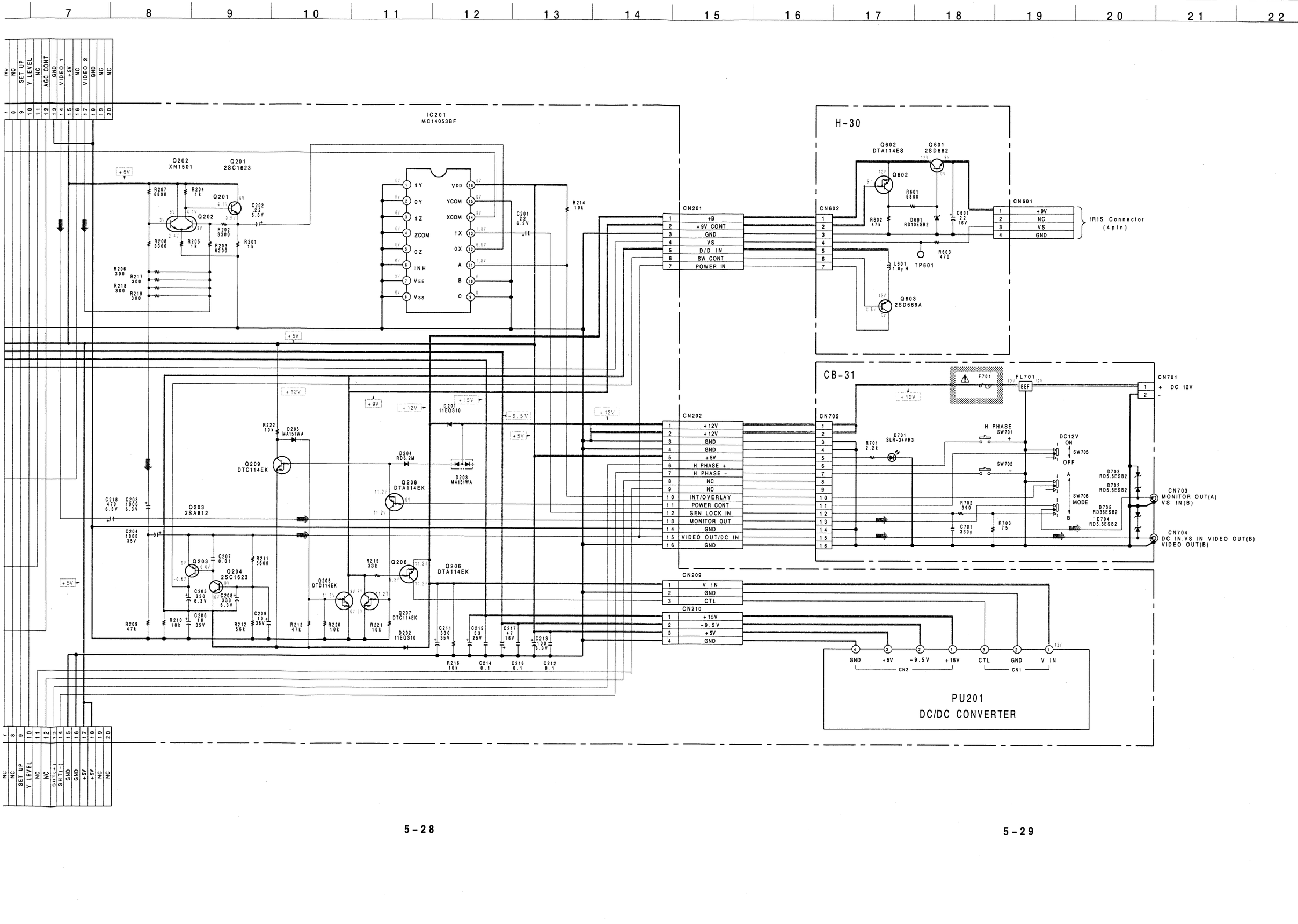
H-30
-(A)SIDE-
1-636-266-12



H-30
-(B)SIDE-
1-636-266-12




1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
MB-31
To PR-32
CN207
NC NC NC Y NC BLK SYNC CLP 4 CLP 3 CLP 2 NC GND NC GND NC GND GND NC GND NC
To PR-32
CN208
NC NC NC NC NC NC NC SET UP Y LEVEL NC AGC CONT GND VIDEO 1 +5V NC VIDEO 2 GND NC NC
To TG-31
CN206
NC 1
NC 2
NC 3
Y 4
NC 5
BLK 6
SYNC 7
CLP4 8
CLP3 9
CLP2 10
NC 11
GND 12
NC 13
GND 14
NC 15
NC 16
GND 17
NC 18
GND 19
+5V 20
+5V 21
-9.5V 22
+15V 23
IRIS OUT 24
To TG-31
CN205
LALT 1
EXT SYNC 2
GND 3
SMD2 4
ED2 5
ED1 6
ED0 7
SWND 8
V BLK 9
VD 10
XSG2 11
ID 12
VG OUT 13
IRIS 14
C IRIS ON/OFF 15
AGC ON/OFF 16
H SHIFT 17
AGC SET 18
IRIS GC 19
0dB 20
AGC MAX 21
V-SUB 22
PG-LL 23
NC 24
L201 22μH
Q202 XN1501
Q201 2SC1623
R207 6800
R204 1k
R208 3300
R205 1k
R202 3300
R203 6200
R201 1k
C202 22 6.3V
R206 300
R217 300
R218 300
R219 300
IC201 MC14053BF
1Y 0Y 1Z ZCOM 0Z INH VEE Vss
VDD YCOM XCOM 1X 0X A B C
C201 22 6.3V
R214 10k
CN201
+B
+9V CONT
GND
VS
D/D IN
SW CONT
POWER IN
R222 10k
D205 MA151WA
Q209 DTC114EK
D201 11EQS10
D204 RD6.2M
D203 MA151WA
Q208 DTA114EK
Q203 2SA812
C218 470 6.3V
C203 1000 6.3V
C204 1000 35V
Q204 2SC1623
C207 0.01
C205 330 6.3V
C208 330 6.3V
R211 5600
R209 47k
R210 18k
C206 10 35V
R212 56k
C209 10 35V
R213 47k
R215 33k
Q206 DTA114EK
Q205 DTC114EK
R220 10k
R221 10k
Q207 DTC114EK
D202 11EQS10
C211 330 35V
C215 33 25V
C217 47 16V
C213 100 6.3V
R216 10k
C214 0.1
C216 0.1
C212 0.1
CN202
+12V
+12V
GND
GND
+5V
H PHASE +
H PHASE -
NC
NC
INT/OVERLAY
POWER CONT
GEN LOCK IN
MONITOR OUT
GND
VIDEO OUT/DC IN
GND
CN209
V IN
GND
CTL
CN210
+15V
-9.5V
+5V
GND
To FC-30
CN204
NC NC NC PG-LL V-SUB AGC MAX 0dB IRIS GC AGC SET V SHIFT AGC ON/OFF E IRIS ON/OFF IRIS VG OUT ID XSG 2 VD V BLK SWND ED0 ED1 ED2 SMD2 GND
To FC-30
CN203
NC NC NC NC NC NC NC SET UP Y LEVEL NC NC SHT(+) SHT(-) GND GND +5V +5V NC NC


IC201
MC14053BF
Q202
XN1501
Q201
2SC1623
Q203
2SA812
Q204
2SC1623
Q205
DTC114EK
Q206
DTA114EK
Q207
DTC114EK
Q208
DTA114EK
Q209
DTC114EK
H-30
Q602
DTA114ES
Q601
2SD882
Q603
2SD669A
D601
RD10ESB2
TP601
L601
1.8μH
IRIS Connector
(4pin)
CB-31
F701
FL701
D701
SLR-34VR3
H PHASE
SW701
SW702
DC12V
ON
OFF
SW705
SW706
MODE
D703
RD5.6ESB2
D702
RD5.6ESB2
D705
RD36ESB2
D704
RD5.6ESB2
CN703
MONITOR OUT(A)
VS IN(B)
CN704
DC IN.VS IN VIDEO OUT(B)
VIDEO OUT(B)
PU201
DC/DC CONVERTER
CN201
+B
+9V CONT
GND
VS
D/D IN
SW CONT
POWER IN
CN202
+12V
+12V
GND
GND
+5V
H PHASE +
H PHASE -
NC
NC
INT/OVERLAY
POWER CONT
GEN LOCK IN
MONITOR OUT
GND
VIDEO OUT/DC IN
GND
CN209
V IN
GND
CTL
CN210
+15V
-9.5V
+5V
GND
CN601
+9V
NC
VS
GND
CN602
CN701
+ DC 12V
-
CN702
CN1
V IN
GND
CTL
CN2
+15V
-9.5V
+5V
GND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

BI-32

CN101

CCD OUT	1	
GND	2	

W101

GND	1	
PG	2	
H1	3	
H2	4	
LH1	5	
GND	6	
15V	7	
VSUB	8	
VL	9	
V1	10	
V2	11	
V3	12	
V4	13	

TG-31

CN401

	1	CCD IN
	2	GND

CN402

	1	GND
	2	PG
	3	H1
	4	H2
	5	LH1
	6	GND
	7	15V
	8	VSUB
	9	VL
	10	V1
	11	V2
	12	V3
	13	V4

CN801

VCONT	1	
OSCCNT	2	
GND	3	
CLKOUT	4	
+5V	5	

LC-31

PR-32

CN404

1	2	LALT
3	4	EXT SYNC
5	6	GND
7	8	SMD2
9	10	ED2
11	12	ED1
13	14	ED0
15	16	SWND
17	18	V BLK
19	20	VD
21	22	XSG2
23	24	ID
		VG OUT
		IRIS
		CIRIS ON/OFF
		AGC ON/OFF
		H SHIFT
		AGC SET
		IRIS GC
		ODB
		AGC-MAX
		V-SUB
		PG-LL
		NC

CN403

1	2	NC
3	4	NC
5	6	Y
7	8	NC
9	10	BLK
11	12	SYNC
13	14	CLP4
15	16	CLP3
17	18	CLP2
19	20	NC
21	22	GND
23	24	GND
		NC
		NC
		GND
		NC
		GND
		+5V
		+5V
		-9.5V
		+15V
		IRIS OUT

CN302

1	2	NC
3	4	NC
5	6	Y
7	8	NC
9	10	BLK
		SYNC
		CLP4
		CLP3
		CLP2

MB-31

CN205

1	2	LALT
3	4	EXT SYNC
5	6	GND
7	8	SMD2
9	10	ED2
11	12	ED1
13	14	ED0
15	16	SWND
17	18	V BLK
19	20	VD
21	22	XSG2
23	24	ID
		VG OUT
		IRIS
		CIRIS ON/OFF
		AGC ON/OFF
		H SHIFT
		AGC SET
		IRIS GC
		ODB
		AGC-MAX
		V-SUB
		PG-LL
		NC

CN206

1	2	NC
3	4	NC
5	6	Y
7	8	NC
9	10	BLK
11	12	SYNC
13	14	CLP4
15	16	CLP3
17	18	CLP2
19	20	NC
21	22	GND
23	24	GND
		NC
		NC
		GND
		NC
		GND
		+5V
		+5V
		-9.5V
		+15V
		IRIS OUT

CN207

1	2	NC
3	4	NC
5	6	Y
7	8	NC
9	10	BLK
		SYNC
		CLP4
		CLP3
		CLP2

CN204

1	2	NC
3	4	NC
5	6	PG-LL
7	8	V-SUB
9	10	AGC-MAX
11	12	ODB
13	14	IRIS GC
15	16	AGC SET
17	18	H SHIFT
19	20	AGC ON/OFF
21	22	CIRIS ON/OFF
23	24	IRIS
		VG OUT
		ID
		XSG2
		VD
		V BLK
		SWND
		ED0
		ED1
		ED2
		SMD2
		GND

CN203

1	2	NC
3	4	NC
5	6	NC
7	8	NC
9	10	NC
11	12	NC
13	14	SET UP
15	16	Y LEVEL
17	18	NC
19	20	NC
		NC
		SHT(+)
		SHT(-)
		GND
		GND
		+5V
		+5V
		NC
		NC

CN201

1	2	+B
3	4	PW CONT
5	6	GND
7		VS
		D/D IN
		SW CONT
		POWER IN

CN209

1	2	V IN
3		GND
		CTL

CN210

1	2	+15V
3	4	-9.5V
		+5V
		GND

CN501

1	2	NC
3	4	NC
5	6	PG-LL
7	8	V-SUB
9	10	AGC-MAX
11	12	ODB
13	14	IRIS GC
15	16	AGC SET
17	18	H SHIFT
19	20	AGC ON/OFF
21	22	CIRIS ON/OFF
23	24	IRIS
		VG OUT
		ID
		XSG2
		VD
		V BLK
		SWND
		ED0
		ED1
		ED2
		SMD2
		GND

CN503

1	2	NC
3	4	NC
5	6	NC
7	8	NC
9	10	NC
11	12	NC
13	14	SET UP
15	16	Y LEVEL
17	18	NC
19	20	NC
		NC
		SHT(+)
		SHT(-)
		GND
		GND
		+5V
		+5V
		NC
		NC

CN602

1	2	+B
3	4	PW CONT
5	6	GND
7		VS
		D/D IN
		SW CONT
		POWER IN

CN502

+5V	1
TMODE	2
SDI	3
SIO	4
SDO	5
SCK	6
GND	7

For Adjustment

CN601

+9V	1
NC	2
VS	3
GND	4

To IRIS Connector (4pin)

V IN GND CTL — CN1

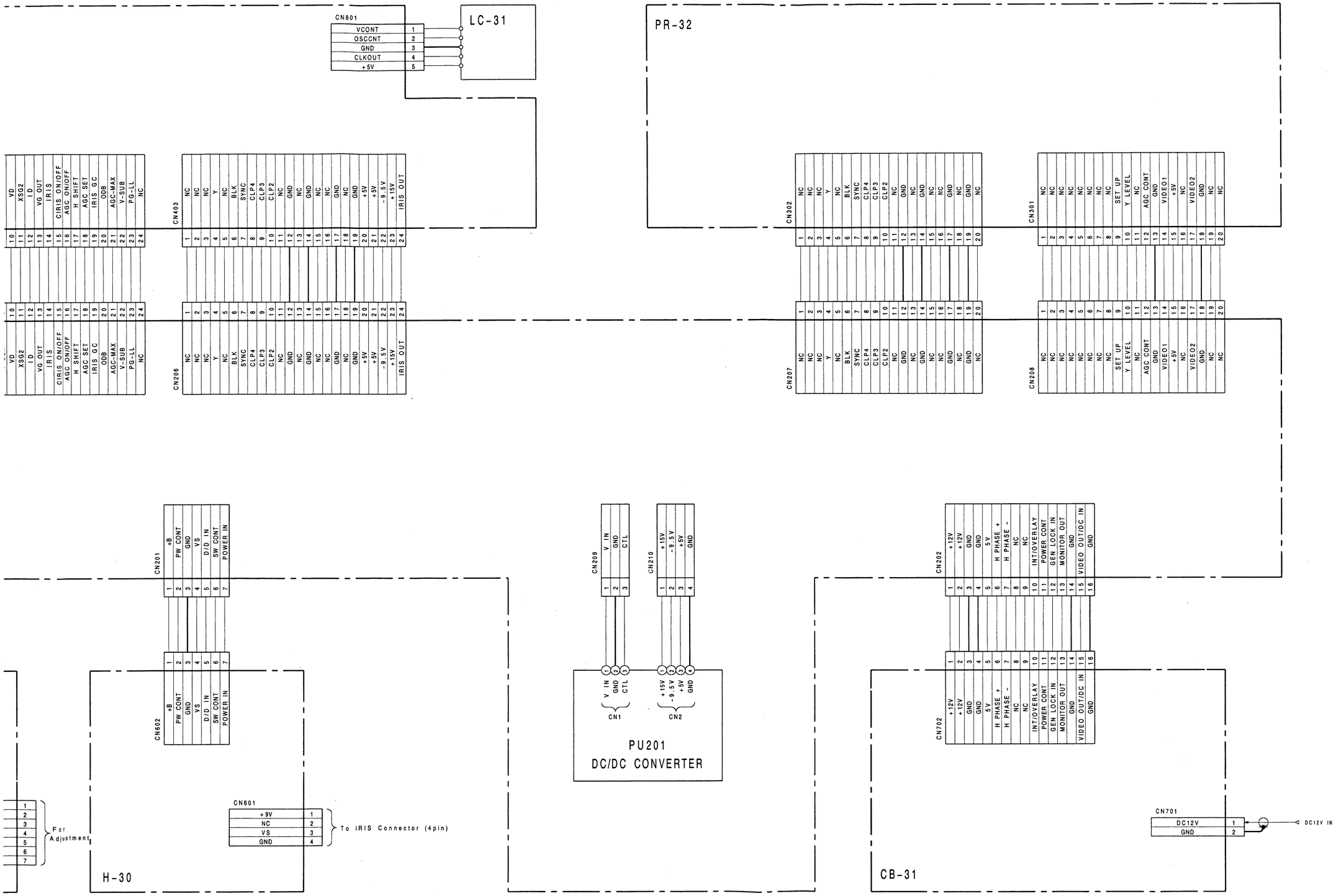
+15V -9.5V +5V GND — CN2

PU201
DC/DC CONVERTER

FC-30

H-30

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22



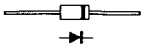
5-4. SEMICONDUCTOR PIN ASSIGNMENTS

等価回路はICメーカーのData Bookに従いました。
The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

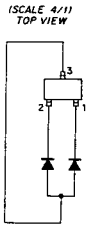
TYPE	PAGE
DIODE	
11EQS10	5-34
1S2836	5-34
1SS226	5-34
1T33C	5-34
GL-3PR9	5-34
MA110	5-34
MA151WA	5-34
MA152WA	5-34
MA153	5-34
RD ? ?ESB ?	5-34
RD ? ?M	5-34
SLR-34VR3	5-34
TRANSISTOR	
2SA1162	5-34
2SA812	5-34
2SC1623	5-34
2SC2757	5-34
2SD669A	5-34
2SD882	5-34
2SK300	5-34
DTA114EK	5-34
DTA114ES	5-34
DTC114EK	5-34
XN1216	5-34
XN1501	5-34
XN4601	5-34

TYPE	PAGE
IC	
CXA1390AR	5-35
CXA1392R	5-36
CXD1159Q	5-37
CXD1250M	5-38
CXD1252AR	5-38
HD14053BFP	5-40
ICX038AL-6	5-40
ICX039AL-6	5-40
MB88341PFV	5-40
MC14053BF	5-40
MC14576AF	5-40
MC14577AF	5-40
MC74HC74AF	5-41
NJM2230M	5-41
S-8054ALB-LM-S	5-41
SC14S66F	5-41
SC406672FU	5-41
SC7S00F	5-42
SC7S04F	5-42
SC7SU04F	5-42
SN74HC51NS	5-42
TC5081AP	5-42
TC74HC123AF	5-42
TC74HC123F	5-42
UPC324G2	5-42
UPC358G2	5-42
UPC393G2	5-42

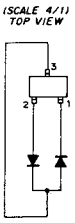
DIODE



11EQS10

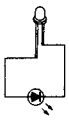


1S2836
MA151WA
MA152WA

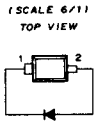


1SS226
MA153

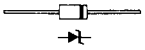
1T33C



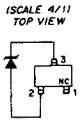
GL-3PR9 ; RED



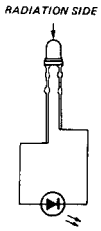
MA110



RD ? ?ESB ?

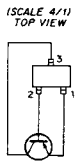


RD ? ?M

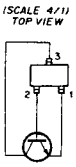


SLR-34VR3 ; RED

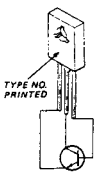
TRANSISTOR



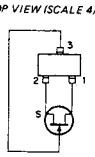
2SA1162
2SA812



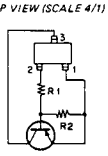
2SC1623
2SC2757



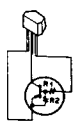
2SD669A
2SD882



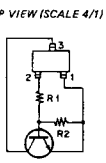
2SK300



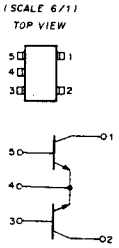
DTA114EK (R1 = 10K, R2 = 10K)



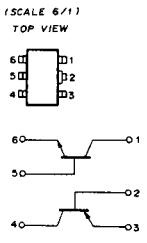
DTA114ES (R1 = 10K, R2 = 10K)



DTC114EK (R1 = 10K, R2 = 10K)



XN1216
XN1501

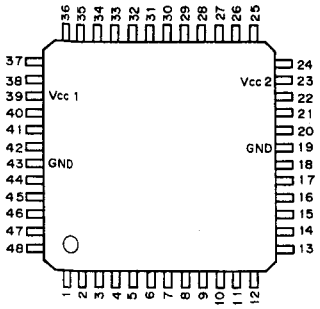


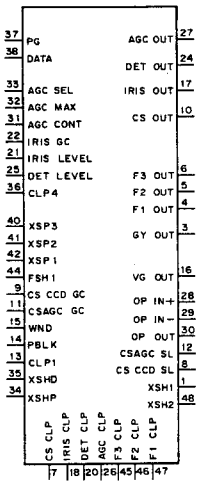
XN4601

IC

CXA1390AR (SONY)

C-MOS SAMPLE & HOLD AND AGC FOR CCD
– TOP VIEW –





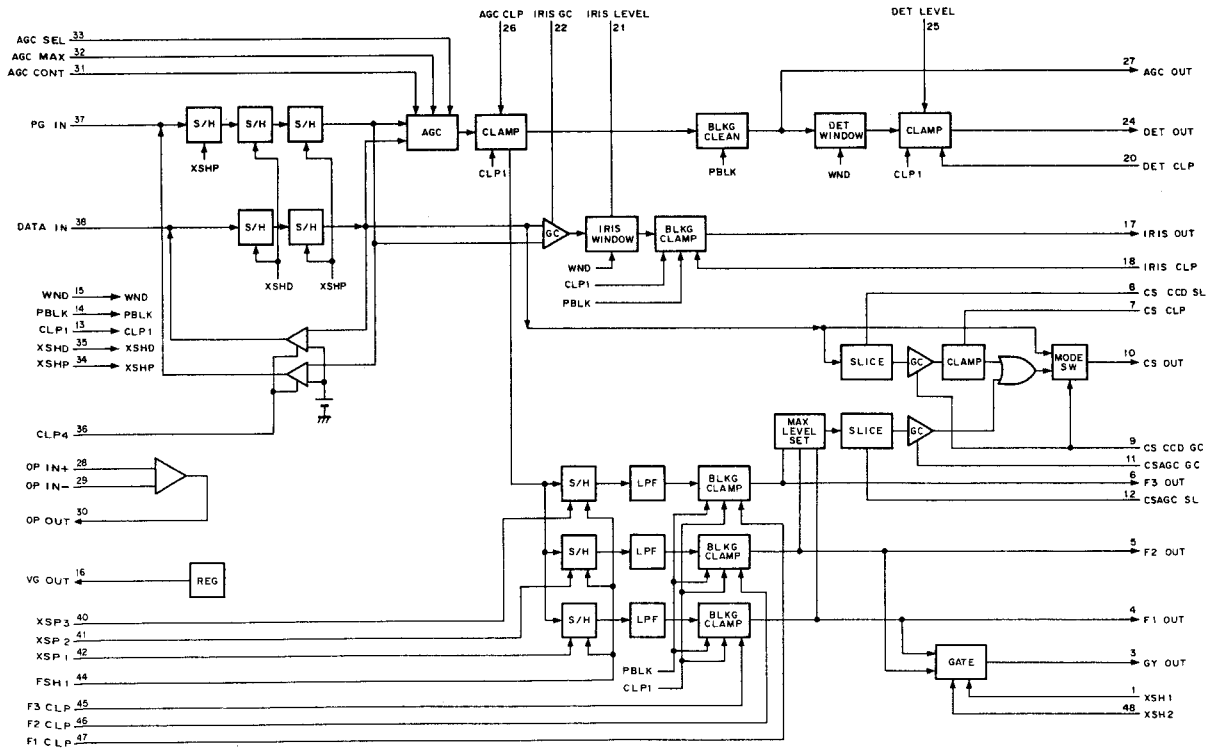
PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL
1	I	XSH1	13	I	CLP 1	25	I	DET LEVEL	37	I	PG IN
2	O	DC OUT	14	I	PBLK	26	I	AGC CLP	38	I	DATA IN
3	O	GY OUT	15	I	WND	27	O	AGC OUT	39	–	Vcc1
4	O	F1 OUT	16	O	VG OUT	28	I	OP IN +	40	I	XSP3
5	O	F2 OUT	17	O	IRIS OUT	29	I	OP IN –	41	I	XSP2
6	O	F3 OUT	18	I	IRIS CLP	30	O	OP OUT	42	I	XSP1
7	I	CS CLP	19	–	GND	31	I	AGC CONT	43	–	GND
8	I	CS CCD SL	20	I	DET CLP	32	I	AGC MAX	44	I	FSH1
9	I	CS CCD GC	21	I	IRIS LEVEL	33	I	AGC SEL	45	I	F3 CLP
10	O	CS OUT	22	I	IRIS GC	34	I	XSHP	46	I	F2 CLP
11	I	CS AGC GC	23	–	Vcc2	35	I	XSHD	47	I	F1 CLP
12	I	CS AGC SL	24	O	DET OUT	36	I	CLP4	48	I	XSH2

INPUT

XSH1, XSH2	; SAMPLE AND HOLD PULSE INPUTS FOR 1H DELAY LINE
XSHP, XSHD	; SAMPLE AND HOLD PULSE INPUTS FOR CCD IMAGER
XSP3, XSP2, XSP1	; SAMPLE AND HOLD PULSE INPUTS FOR COLOR SEPARATION
CS CLP	; CLAMP INPUT FOR COLOR SEPARATION
IRIS CLP	; CLAMP INPUT FOR IRIS CONT
DET CLP	; CLAMP INPUT FOR SIGNAL DETECT
AGC CLP	; CLAMP INPUT FOR AGC
F3/F2/F1 CLP	; CLAMP INPUTS FOR F1, F2 AND F3
CS CCD SL	; HIGH LUMINANCE DET LEVEL ADJ FOR INPUT SIGNAL
CS CCD GC	; HIGH LUMINANCE GAIN ADJ FOR INPUT SIGNAL
CSAGC GC	; HIGH LUMINANCE DET LEVEL ADJ FOR AFTER AGC
CSAGC SL	; HIGH LUMINANCE DET LEVEL ADJ FOR INPUT SIGNAL
IRIS LEVEL	; WEIGHT ADJ INPUT FOR DET OUTPUT
IRIS GC	; GAIN CONT INPUT FOR IRIS OUT
DET LEVEL	; WEIGHT ADJ INPUT FOR DET OUTPUT
AGC CONT	; AGC AMPLIFIER GAIN CONT INPUT
AGC MAX	; AGC AMPLIFIER MAX GAIN CONT INPUT
CLP1	; CLAMP PULSE 1 INPUT
PBLK	; PRE BLKG PULSE INPUT
WND	; WINDOW PULSE INPUT
CLP4	; CLAMP PULSE 4 INPUT
OP IN +	; NON-INVERTING INPUT OF OPERATIONAL AMPLIFIER
OP IN –	; INVERTING INPUT OF OPERATIONAL AMPLIFIER
AGC SEL	; GAIN SELECT FOR AGC AMPLIFIER
PG IN	; CCD SIGNAL INPUT
DATA IN	; CCD SIGNAL INPUT
FSHI	; LOCK SPEED ADJ INPUT FOR COLOR SEPARATION S/H

OUTPUT

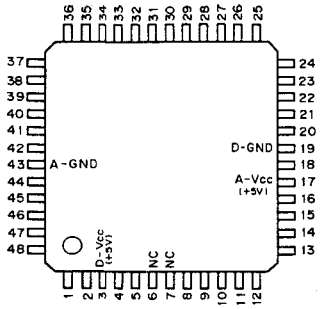
GY OUT	; GY OUTPUT
F1, F2, F3 OUT	; F1, F2 AND F3 OUTPUTS
AGC OUT	; AGC OUTPUT
CS OUT	; COLOR SEPARATION OUTPUT
IRIS OUT	; IRIS OUTPUT
DET OUT	; DET OUTPUT
VG OUT	; REGULATED DC OUTPUT
OP OUT	; OPERATIONAL AMPLIFIER OUTPUT



CXA1392R (SONY) FLAT PACKAGE

ENCODER FOR CCD COLOR CAMERA

– TOP VIEW –



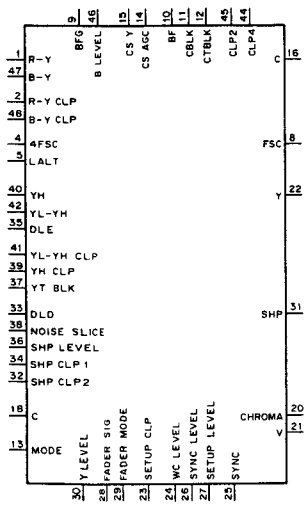
PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL	PIN No.	I/O	SYMBOL
1	I	R-Y	13	I	MODE	25	I	SYNC	37	I	YTBLK
2	I	R-Y CLP	14	I	CS AGC	26	I	SYNC LEVEL	38	I	NOISE SLICE
3	–	D-Vcc(+5V)	15	I	CSY	27	I	SETUP LEVEL	39	I	YH CLP
4	I	4FSC	16	O	C	28	I	FADER SIG	40	I	YH
5	I	LALT	17	–	A-Vcc(+5V)	29	I	FADER MODE	41	I	YL-YH CLP
6	–	NC	18	I	C	30	I	Y LEVEL	42	I	YL-YH
7	–	NC	19	–	D-GND	31	O	SHP	43	–	A-GND
8	O	FSC	20	O	CHROMA	32	I	SHP CLP2	44	I	CLP4
9	I	BFG	21	O	V	33	I	DLD	45	I	CLP2
10	I	BF	22	O	Y	34	I	SHP CLP1	46	I	B LEVEL
11	I	CBLK	23	I	SETUP CLP	35	I	DLE	47	I	B-Y
12	I	CTBLK	24	I	WC LEVEL	36	I	SHP LEVEL	48	I	B-Y CLP

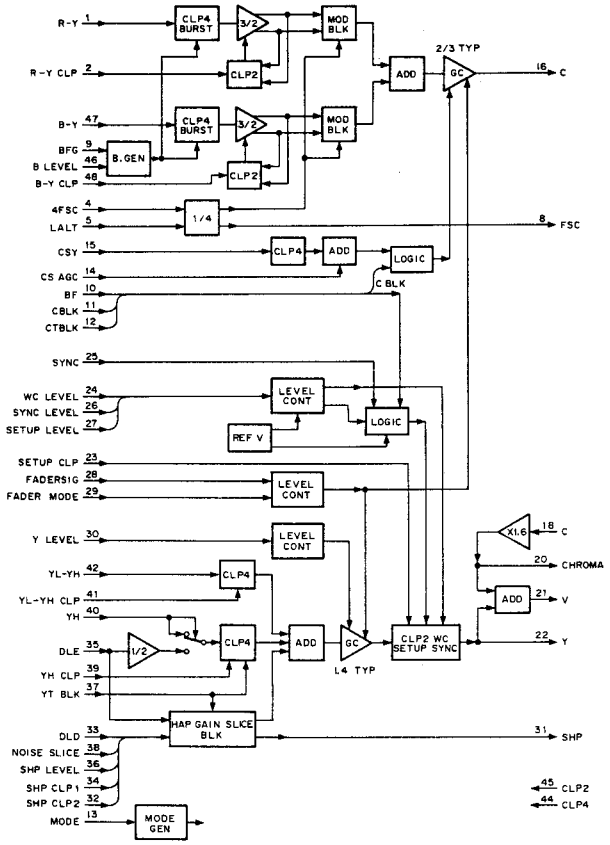
INPUT

4FSC	; 4FSC USED TO MAKE UP THE SUB CARRIER
B LEVEL	; CONTROLS THE BURST LEVEL
BF	; BURST FLAG PULSE
BFG	; INSERTS PULSE SLIGHT LARGER THAN BF ON BOTH ENDS
C	; INPUT FOR CHROMA SIGNAL PASSED THROUGH BPF
CBLK	; COMPOSITE BLANKING PULSE
CLP2, 4	; CLAMP2, 4 PULSE INPUT
CS AGC	; SUPPRESS CHROMA SIGNAL AT THE AGC GAIN CONTROL SIGNAL
CSY	; SUPPRESS CHROMA SIGNAL AT THE Y SIGNAL
CTBLK	; CHROMA TITLER PULSE
DLD	; CONNECTS THE DELAY LINE DRIVE SIDE OF THE APERTURE SIGNAL
DLE	; CONNECTS THE DELAY LINE END SIDE OF THE APERTURE SIGNAL
FADER MODE	; BLACK FADER AND WHITE FADER MODE SELECT
FADER SIG	; CONTROLS THE SIGNAL SUPPRESS LEVEL DURING BLACK FADER, CONTROLS THE SIGNAL SUPPRESS LEVEL DURING WHITE FADER AND AT THE SAME TIME CONTROLS THE SET UP LEVEL
LALT	; INPUT FOR LINE ALTERNATE SIGNAL DURING PAL MODE
MODE	; SELECTS NTSC, PAL OR NTSC × 2, PAL × 2 MODES
NOISE SLICE	; CONTROLS THE SLICE LEVEL OF THE APERTURE SIGNAL
R-Y, B-Y	; R-Y, B-Y SIGNAL
R-Y, B-Y CLP	; CONNECTING THE CAPACITOR FOR R-Y, B-Y MODULATOR CLAMP
SETUP CLP	; CONNECTING FOR THE WHITE CLIP CLAMP CAPACITOR
SETUP LEVEL	; SET UP LEVEL CONTROL
SHP CLP1, 2	; CONNECTS THE CLAMP CAPACITOR USED FOR THE SLICE OF THE APERTURE SIGNAL
SHP LEVEL	; CONTROL OF THE APERTURE SIGNAL LEVEL
SYNC	; SYNC PULSE
SYNC LEVEL	; SYNC LEVEL CONTROL
WC LEVEL	; WHITE CLIP LEVEL CONTROL
Y LEVEL	; Y SIGNAL LEVEL CONTROL
YH	; YH SIGNAL
YH CLP	; CONNECTS THE CAPACITOR FOR YH INPUT CLAMP
YL-YH	; V APERTURE SIGNALS, TITLER SIGNALS AND YL-YH SIGNALS
YL-YH CLP	; CONNECTS THE CAPACITOR FOR YL-YH INPUT CLAMP
YTBLK	; Y TITLER PULSE

OUTPUT

C	; CHROMA SIGNAL OUTPUT
CHROMA	; CHROMA SIGNAL OUTPUT WHEN USED FOR Y/C SEPARATION OUTPUT
FSC	; OUTPUTS A SUB CARRIER WITH THE SAME PHASE AS B-Y
SHP	; APERTURE SIGNAL
V	; COMPOSITE VIDEO SIGNAL
Y	; Y SIGNAL OUTPUT WHEN USED FOR Y/C SEPARATION OUTPUT

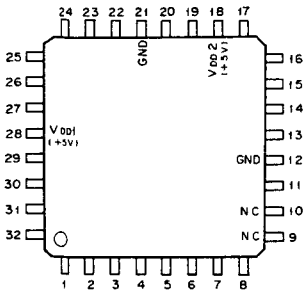


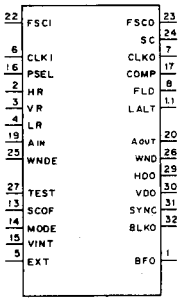


CXD1159Q (SONY)

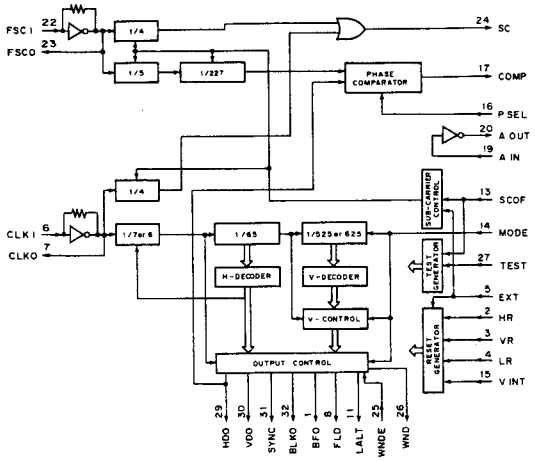
C-MOS SYNC GENERATOR

– TOP VIEW –





PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	BFO	9	–	NC	17	O	COMP	25	I	WNDE
2	I	HR	10	–	NC	18	–	VDD2(+5V)	26	O	WND
3	I	VR	11	O	LALT	19	I	AIN	27	I	TEST
4	I	LR	12	–	GND	20	O	AOUT	28	–	VDD1(+5V)
5	I	EXT	13	I	SCOF	21	–	GND	29	O	HDO
6	I	CLKI	14	I	MODE	22	I	FSCI	30	O	VDO
7	O	CLKO	15	I	VINT	23	O	FSCO	31	O	SYNC
8	O	FLD	16	I	PSEL	24	O	SC	32	O	BLKO



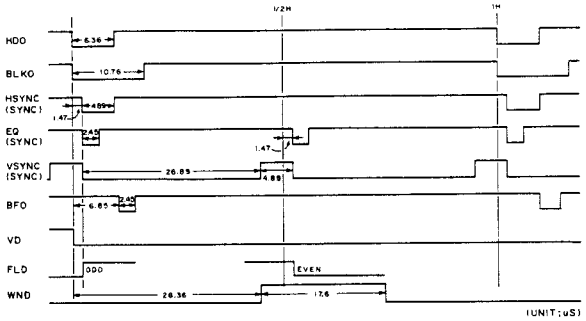
INPUT

AIN	; FILTER INVERTER INPUT
CLKI	; CLOCK INPUT (NTSC ; 14.31818MHz /PAL ; 14.1875MHz)
EXT	; INT/EXT (L ; INT)
FSCI	; 4FSC CLOCK INPUT
HR	; H RESET
LR	; LALT RESET
MODE	; NTSC/PAL (L ; NTSC)
PSEL	; POLARITY SELECT FOR PHASE COMP
SCOF	; SUBCARRIER OFF (L ; OFF)
TEST	; TEST INPUT
VINT	; INITIALIZE
VR	; V RESET
WNDE	; WINDOW ENABLE

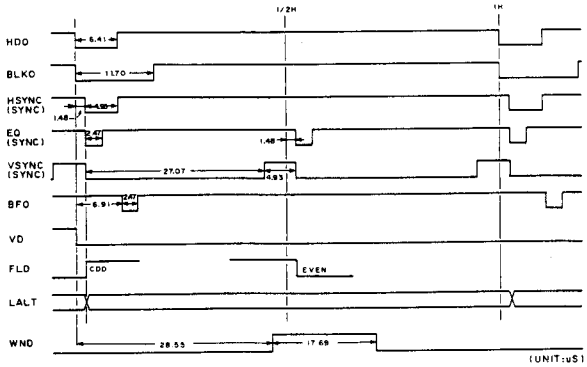
OUTPUT

AOUT	; FILTER INVERTER OUTPUT
BFO	; BURST FLAG PULSE
BLKO	; COMPOSITE BLANKING PULSE
CLKO	; CLOCK OUTPUT
COMP	; PHASE COMP
FLD	; FIELD PULSE
FSCO	; 4FSC CLOCK OUTPUT
HDO	; H DRIVE PULSE
LALT	; LINE ALTERNATE PULSE
SC	; SUBCARRIER
SYNC	; COMPOSITE SYNC PULSE
VDO	; V DRIVE PULSE
WND	; WINDOW

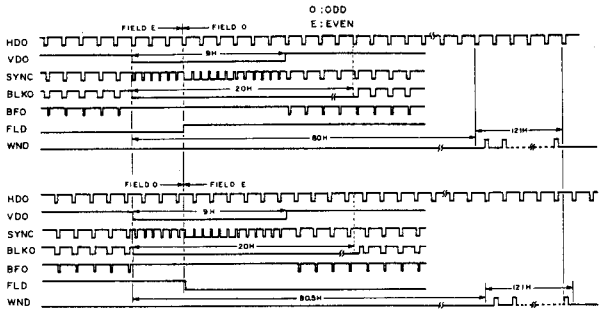
TIMING CHART H (NTSC)



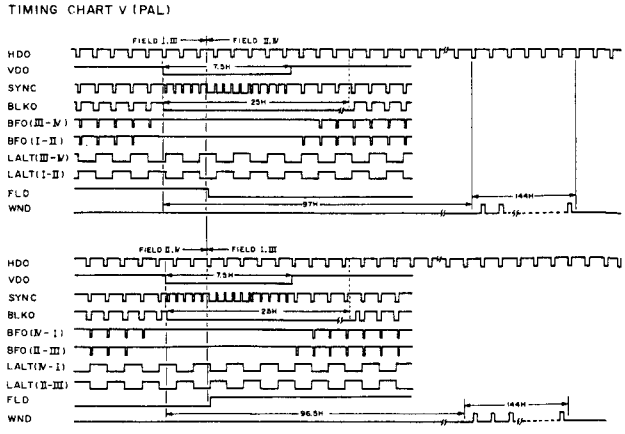
TIMING CHART H (PAL)



TIMING CHART V (NTSC)



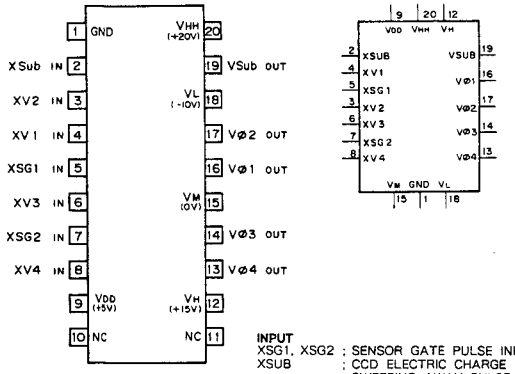
TIMING CHART V (PAL)



CXD1250M (SONY) FLAT PACKAGE

C-MOS VERTICAL CLOCK DRIVER FOR CCD

– TOP VIEW –



INPUT

XSG1, XSG2 ; SENSOR GATE PULSE INPUT

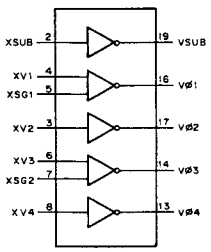
XSUB ; CCD ELECTRIC CHARGE SWEEPING AWAY PULSE INPUT

XV1-XV4 ; VERTICAL REGISTER TRANSMISSION CLOCK INPUT

OUTPUT

VSUB ; CCD ELECTRIC CHARGE SWEEPING AWAY PULSE OUTPUT

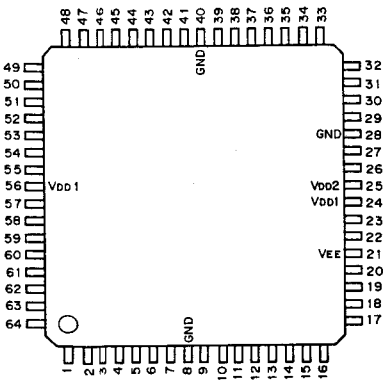
V φ 1-V φ 4 ; VERTICAL REGISTER TRANSMISSION CLOCK OUTPUT



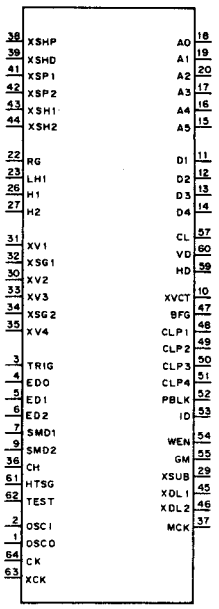
CXD1252AR (SONY)

C-MOS TIMING PULSE GENERATOR FOR CCD

– TOP VIEW –



PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	O	OSCO	17	O	A3	33	O	XV3	49	O	CLP2
2	I	OSCI	18	O	A0	34	O	XSG2	50	O	CLP3
3	I	TRIG	19	O	A1	35	O	XV4	51	O	CLP4
4	I	ED0	20	O	A2	36	I	CH	52	O	PBLK
5	I	ED1	21	–	VEE	37	O	MCK	53	O	ID
6	I	ED2	22	O	RG	38	O	XSHP	54	O	WEN
7	I	SMD1	23	O	LH1	39	O	XSHD	55	I	GM
8	–	GND	24	–	VDD1	40	–	GND	56	–	VDD1
9	I	SMD2	25	–	VDD2	41	O	XSP1	57	O	CL
10	O	XVCT	26	O	H1	42	O	XSP2	58	I	PS
11	I	D1	27	O	H2	43	O	XSH1	59	I	HD
12	I	D2	28	–	GND	44	O	XSH2	60	I	VD
13	I	D3	29	O	XSUB	45	O	XDL1	61	I	HTSG
14	I	D4	30	O	XV2	46	O	XDL2	62	I	TEST
15	O	A5	31	O	XV1	47	O	BFG	63	O	XCK
16	O	A4	32	O	XSG1	48	O	CLP1	64	I	CK

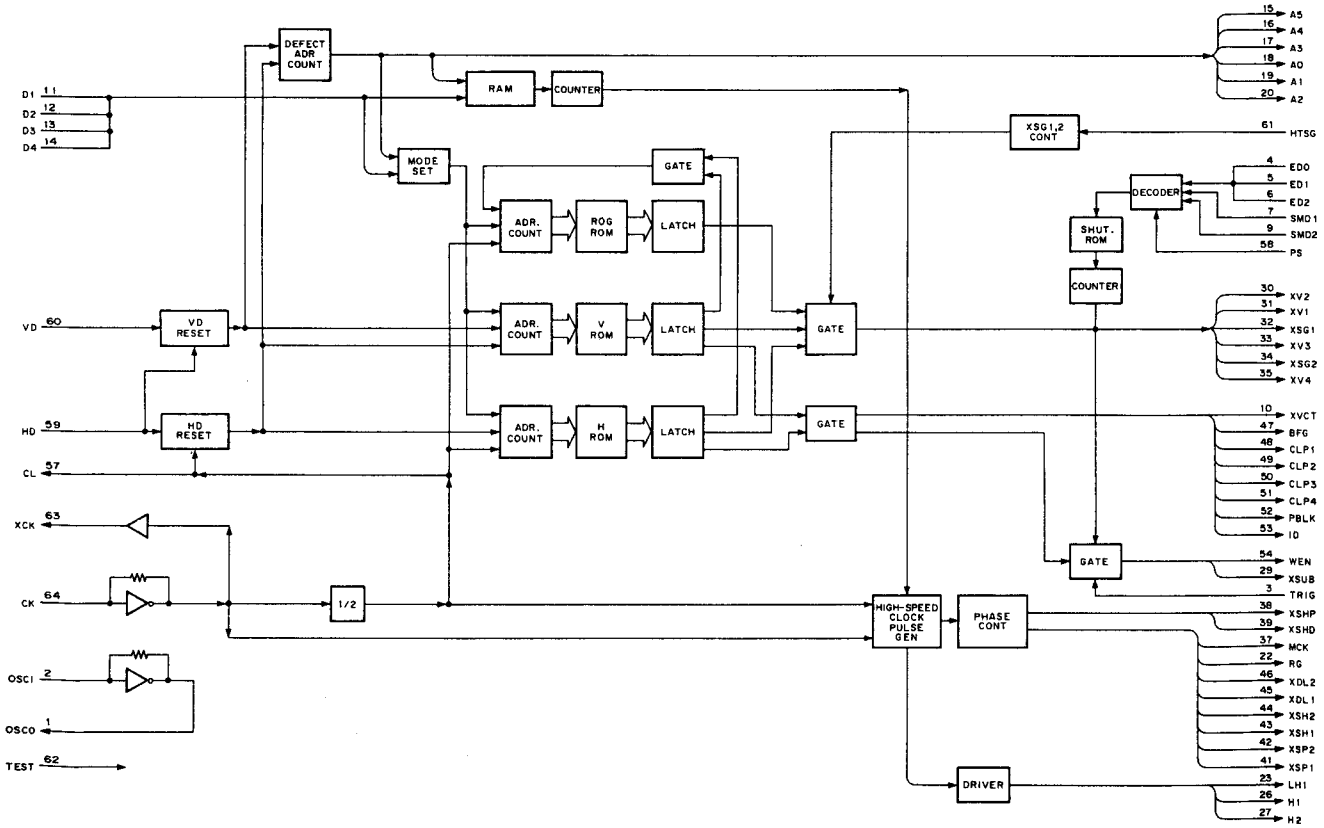


INPUT

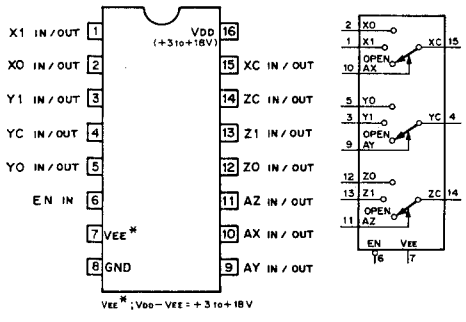
CH	; MOSAIC/STRIPE COLOR CODING (L ; MOSAIC) SELECT SIGNAL
CK	; MAIN CLOCK PULSE
D1-D4	; DATA INPUT FOR EXTERNAL ROM
ED0-ED2	; SHUTTER SPEED CONTROL PULSE
GM	; NORMAL/G3 SELECT SIGNAL (L ; NORMAL, H ; G3)
HD	; HORIZONTAL DRIVE PULSE
HTSG	; XSG1, XSG2 CONTROL PULSE (L ; STOP, H ; GENERATE)
OSCI	; INVERTER INPUT FOR OSCILLATOR
SMD1, SMD2	; SHUTTER MODE SET SIGNAL
TEST	; TEST SIGNAL (H ; TEST MODE)
TRIG	; CONTINUOUS VARIABLE SHUTTER CONTROL PULSE
VD	; VERTICAL DRIVE PULSE

OUTPUT

A0-A5	; ADDRESS OUTPUT FOR EXTERNAL ROM
BFG	; ENCODER/CHROMA MODULATOR PULSE
CL	; 1/2 CK PULSE
CLP1-CLP4	; CLAMP PULSE
H1, H2	; CLOCK PULSE FOR DRIVING HORIZONTAL REGISTER
ID	; LINE DISCRIMINATE PULSE (MOSAIC MODE) : L (STRIPE MODE)
LH1	; CLOCK PULSE FOR DRIVING CCD HORIZONTAL FINAL REGISTER
MCK	; CLOCK PULSE FOR G3
OSCO	; INVERTER OUTPUT FOR OSCILLATOR
PBLK	; BLANKING CLEANING PULSE
RG	; RESET GATE PULSE
WEN	; WRITE ENABLE PULSE (ONLY LOW SPEED SHUTTER MODE)
XCK	; INVERTED CK PULSE
XDL1, XDL2	; DELAY LINE CLOCK (MOSAIC MODE) /CHROMA SEPARATE S/H PULSE (STRIPE)
XSG1, XSG2	; CCD SENSOR ELECTRIC CHARGE READ OUT PULSE
XSH1, XSH2	; SELECT S/H PULSE
XSHD	; DATA S/H PULSE
XSHP	; PRE CHARGE S/H PULSE
XSP1, XSP2	; CHROMA SEPARATE S/H PULSE
XSUB	; CCD ELECTRIC CHARGE SWEEPING AWAY PULSE
XV1-XV4	; CLOCK PULSE FOR DRIVING CCD VERTICAL REGISTER
XVCT	; POW



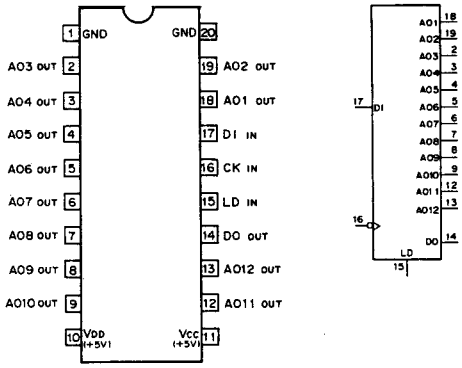
HD14053BFP (HITACHI) FLAT PACKAGE
MC14053BF (MOTOROLA) FLAT PACKAGE
C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
– TOP VIEW –



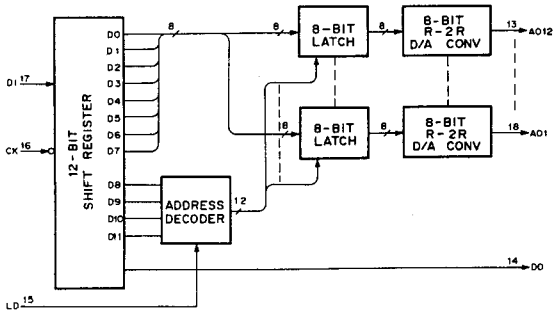
CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

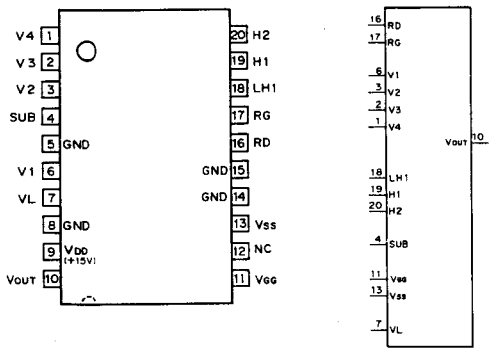
MB88341PFV (FUJITSU) FLAT PACKAGE
C-MOS 8-BIT D/A CONVERTER
– TOP VIEW –



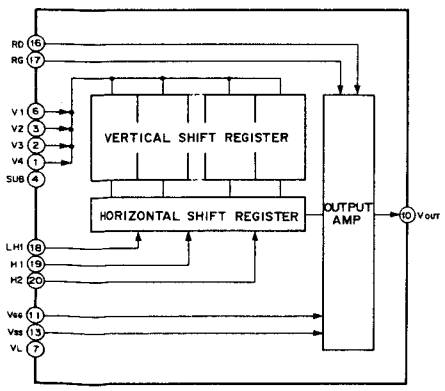
AO1 – AO12 : 8-BIT D/A OUTPUTS
CK : CLOCK INPUT
DI : SERIAL DATA INPUT
DO : DATA OUTPUT
LD : DATA LOAD CONTROL INPUT (H : LOAD)



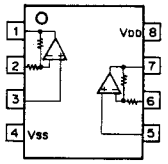
ICX038AL (SONY) (NTSC,MONOCHROME)
ICX039AL (SONY) (PAL,MONOCHROME)
1/2-INCH CCD IMAGE BLOCK
– BOTTOM VIEW –



H1, H2 : HORIZONTAL REGISTER TRANSFER CLOCK
LH1 : HORIZONTAL REGISTER LAST STAGE TRANSFER CLOCK
RD : RESET DRAIN BIAS
RG : RESET GATE CLOCK
SUB : OVERFLOW DRAIN
VGG : OUTPUT AMP GATE BIAS
VL : PROTECTION TRANSISTOR BIAS
VSS : OUTPUT AMP SOURCE
V1 – V4 : VERTICAL REGISTER TRANSFER CLOCK
VOUT : SIGNAL OUTPUT

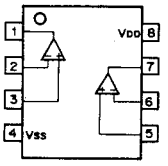


MC14576AF (MOTOROLA) FLAT PACKAGE
CMOS DUAL VIDEO AMPLIFIER
– TOP VIEW –



*VDD + | VSS | = +5V to +12V

MC14577AF (MOTOROLA)
DUAL VIDEO AMPLIFIER
– TOP VIEW –

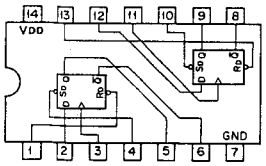


*VDD + | VSS | = +5V to +12V

MC74HC74AF (MOTOROLA) FLAT PACKAGE

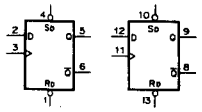
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET

– TOP VIEW –



INPUTS				OUTPUTS	
$\overline{S_D}$	$\overline{R_D}$	CK	D	Qn+1	$\overline{Q_{n+1}}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1	1
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	Qn	$\overline{Q_n}$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE



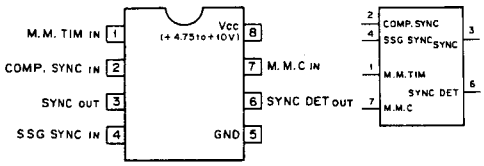
NOTE :

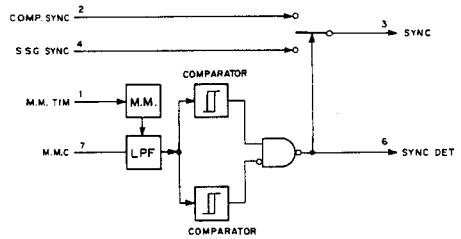
TYPE	VDD
74ACT	+5V
TC74AC74F	+2 to +5.5V
TC74ACT74F	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

NJM2230M (JRC) FLAT PACKAGE

VIDEO SIGNAL DETECTOR

– TOP VIEW –

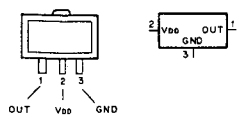




S-8054ALB-LM-S (SEIKO)

C-MOS VOLTAGE DETECTOR

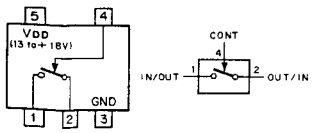
– TOP VIEW –



SC14S66F (MOTOROLA) FLAT PACKAGE

C-MOS BILATERAL ANALOG SWITCH

– TOP VIEW –



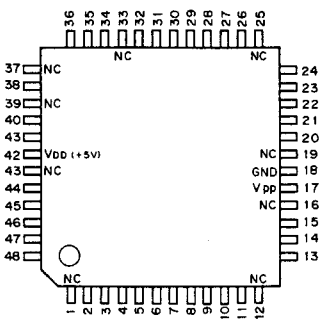
CONT	SWITCH
0	OFF
1	ON

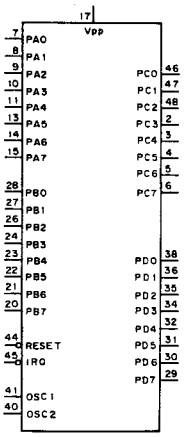
0 ; LOW LEVEL
1 ; HIGH LEVEL

SC406672FU (MOTOROLA)

C-MOS 8-BIT MICROPROCESSOR

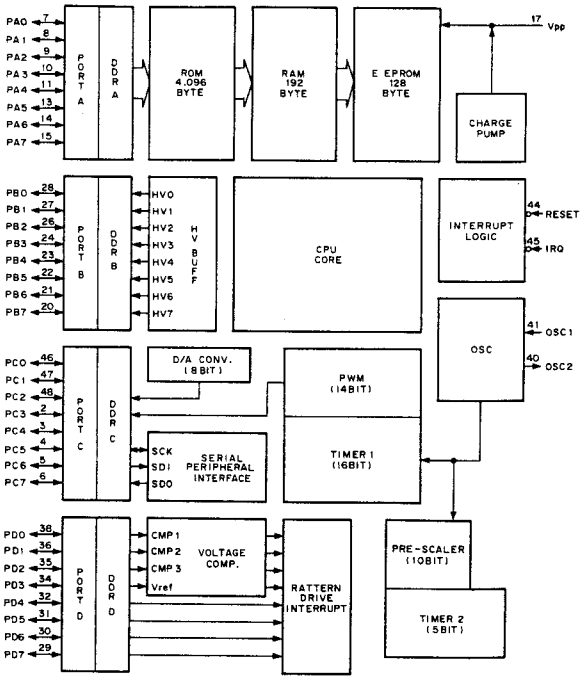
– TOP VIEW –



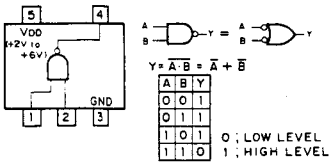


IRQ : INTERRUPT REQUEST INPUT
OSC1 : OSC FREQ INPUT
OSC2 : OSC FREQ OUTPUT
PA0 – PA7 : I/O PORT A
PB0 – PB7 : I/O PORT B
PC0 – PC7 : I/O PORT C
PD0 – PD7 : I/O PORT D
RESET : RESET PULSE INPUT

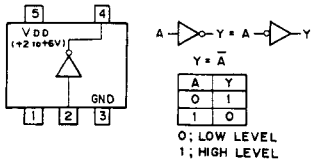
PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	–	NC	13	I/O	PA5	25	–	NC	37	–	NC
2	I/O	PC3	14	I/O	PA6	26	I/O	PB2	38	I/O	PD0
3	I/O	PC4	15	I/O	PA7	27	I/O	PB1	39	–	NC
4	I/O	PC5	16	–	NC	28	I/O	PB0	40	O	OSC2
5	I/O	PC6	17	I	VPP	29	I/O	PD7	41	I	OSC1
6	I/O	PC7	18	–	GND	30	I/O	PD6	42	–	VDD (+5V)
7	I/O	PA0	19	–	NC	31	I/O	PD5	43	–	NC
8	I/O	PA1	20	I/O	PB7	32	I/O	PD4	44	I	$\overline{RESET}$
9	I/O	PA2	21	I/O	PB6	33	–	NC	45	I	$\overline{IRQ}$
10	I/O	PA3	22	I/O	PB5	34	I/O	PD3	46	I/O	PC0
11	I/O	PA4	23	I/O	PB4	35	I/O	PD2	47	I/O	PC1
12	–	NC	24	I/O	PB3	36	I/O	PD1	48	I/O	PC2



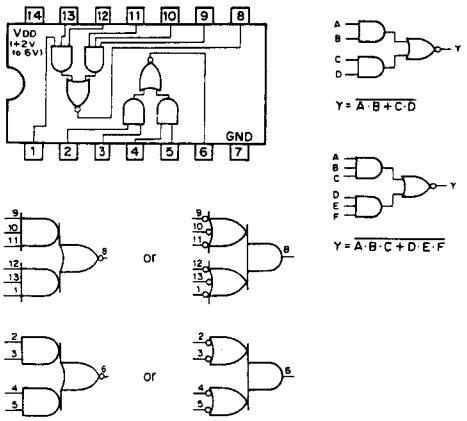
SC7S00F (MOTOROLA) FLAT PACKAGE
C-MOS 2-INPUT NAND GATE
– TOP VIEW –



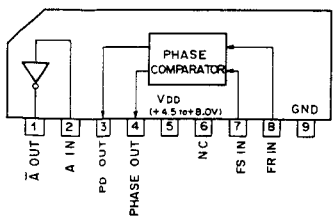
SC7S04F (MOTOROLA) FLAT PACKAGE
SC7SU04F (MOTOROLA) FLAT PACKAGE
C-MOS INVERTER
– TOP VIEW –



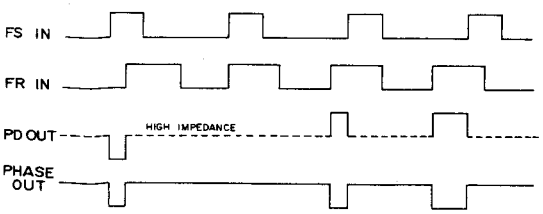
SN74HC51NS (TI) FLAT PACKAGE
C-MOS DUAL AND/OR INVERT GATE
– TOP VIEW –



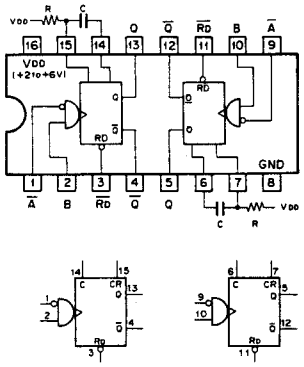
TC5081AP (TOSHIBA)
C-MOS PHASE COMPARATOR
– SIDE VIEW –



PHASE COMPARATOR TIMING CHART



TC74HC123AF (TOSHIBA) FLAT PACKAGE
TC74HC123F (TOSHIBA) FLAT PACKAGE
C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
– TOP VIEW –

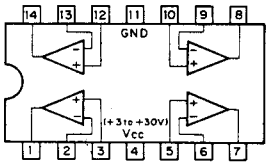


INPUT			OUTPUT	
RD	A	B	Q	Q̄
0	X	X	0	1
1	1	X	0	1
1	X	0	0	1
1	0	↑	⊓	⊔
1	↓	1	⊓	⊔
↓	0	1	⊓	⊔

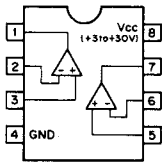
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

OUTPUT PULSE WIDTH = 0.46CR

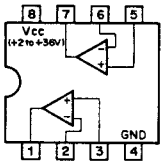
UPC324G2 (NEC) FLAT PACKAGE
QUAD. OP AMPLIFIER
– TOP VIEW –



UPC358G2 (NEC) FLAT PACKAGE
DUAL OPERATIONAL AMPLIFIERS
– TOP VIEW –



UPC393G2 (NEC) FLAT PACKAGE
DUAL VOLTAGE COMPARATORS
– TOP VIEW –



SECTION 6
REPAIR PARTS

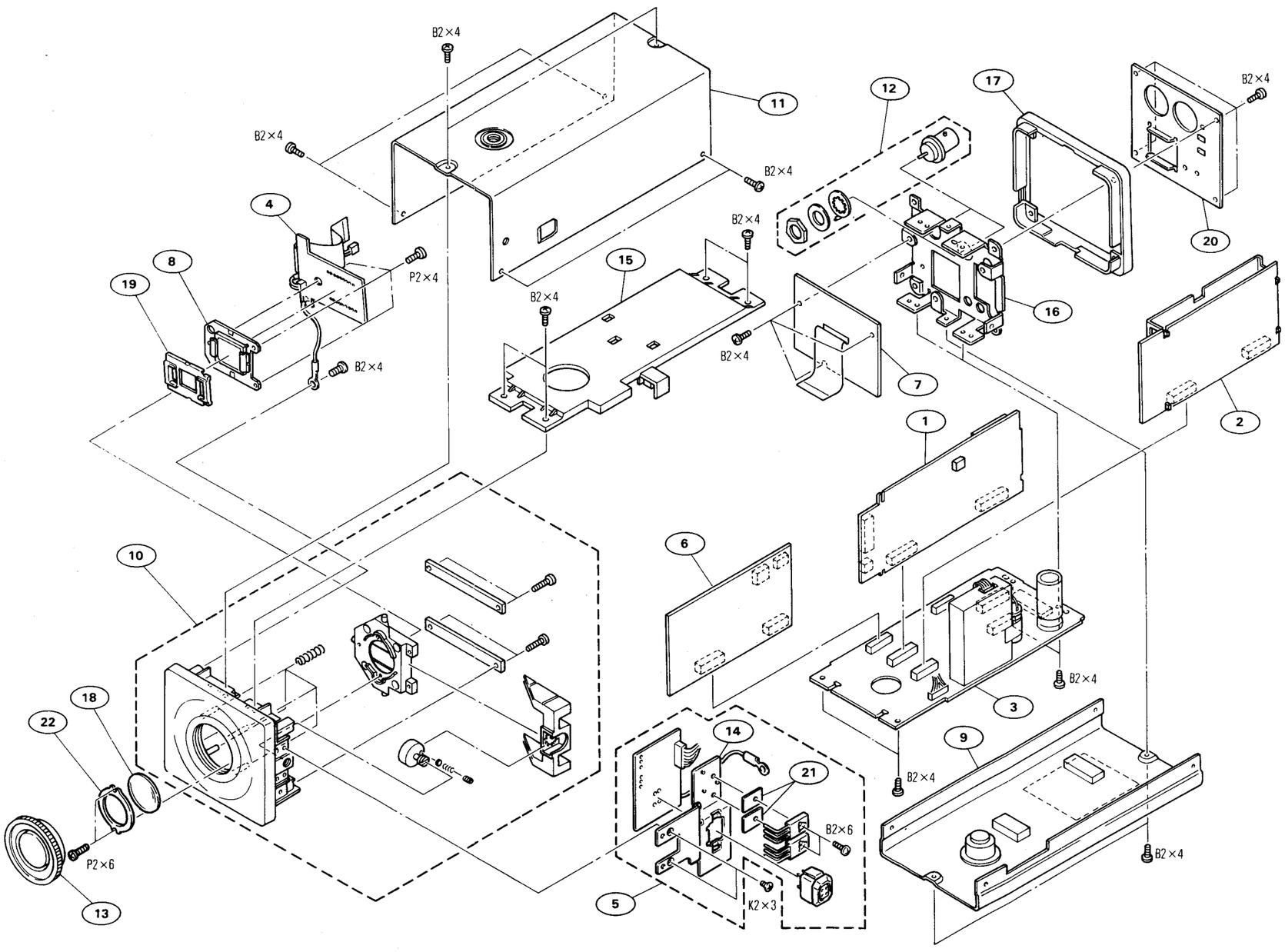
【NOTE】

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- All resistors are in ohms.
- Items marked "o" in the SP column are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ are critical for safety. Replace only with part number specified.

6-1. EXPLODED VIEW AND PARTS LIST

No.	Part No.	SP	Description
1	A-7515-347-A	o	MOUNTED CIRCUIT BOARD, TG-31C7(EK)
	A-7515-348-A	o	MOUNTED CIRCUIT BOARD, TG-31E7(UC)
2	A-7515-346-A	o	MOUNTED CIRCUIT BOARD, PR-32C7(EK)
	A-7515-349-A	o	MOUNTED CIRCUIT BOARD, PR-32E7(UC)
3	A-7520-503-A	o	MOUNTED CIRCUIT BOARD, MB-31
4	A-7520-563-A	o	MOUNTED CIRCUIT BOARD, BI-32
5	A-7520-508-A	o	MOUNTED CIRCUIT BOARD, H-30
6	A-7515-353-A	o	MOUNTED CIRCUIT BOARD, FC-30E7(UC)
	A-7520-527-A	o	MOUNTED CIRCUIT BOARD, FC-30C5(EK)
7	A-7520-529-A	o	MOUNTED CIRCUIT BOARD, CB-31 (M)
8	A-7550-127-A	s	CCD BLOCK ASSY (FOR SERVICE) (UC)
	A-7550-128-A	s	CCD BLOCK ASSY (FOR SERVICE) (EK)
9	X-3165-042-3	o	CASE ASSY, LOWER
10	X-3165-043-1	o	PANEL ASSY, FRONT
11	X-3166-080-1	o	CASE ASSY, UPPER(EK)
	X-3166-082-1	o	CASE ASSY, UPPER(UC)
12	1-580-724-11	s	CONNECTOR, BNC
13	2-042-385-00	s	CAP, C MOUNT
14	3-165-271-01	o	PLATE, CONNECTOR
15	3-165-272-02	o	STAY
16	3-165-273-01	o	CHASSIS, REAR
17	3-165-806-01	o	FRAME, REAR
18	3-167-174-01	o	GLASS, COVER
19	3-167-175-01	s	RUBBER (T), SEAL
20	3-167-179-01	o	PLATE, REAR
21	4-386-536-01	s	SHEET, SILICON
22	4-393-807-01	o	BRACKET (B/W), FILTER
	7-621-772-10	s	SCREW +B 2X4
	7-621-772-38	s	SCREW +B 2X6
	7-627-452-18	s	SCREW, PRECISION +K 2X3
	7-627-553-48	s	SCREW, PRECISION +P 2X4 TYPE3
	7-627-553-68	s	SCREW, PRECISION +P 2X6 TYPE3



6-2. ELECTRICAL PARTS LIST

BI-32 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-563-A	o	MOUNTED CIRCUIT BOARD, BI-32
C101	1-164-161-11	s	CERAMIC, CHIP 0.0022uF 10% 100V
C102	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C103	1-135-092-21	s	TANTALUM, CHIP 3.3uF 10% 16V
C104	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C105	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C106	1-135-162-21	s	TANTAL 33uF 10% 6.3V
C107	1-135-092-21	s	TANTALUM, CHIP 3.3uF 10% 16V
C108	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
CN101	1-946-454-11	o	HARNESS (CONNECTOR ASSY 2P)
Q101	8-765-420-02	s	TRANSISTOR 2SK300-3
R101	1-216-063-00	s	METAL, CHIP 3.9K 5% 1/10W
R102	1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R103	1-216-083-00	s	METAL, CHIP 27K 5% 1/10W
R104	1-216-103-00	s	METAL, CHIP 180K 5% 1/10W
R105	1-216-039-00	s	METAL, CHIP 390 5% 1/10W
W101	1-590-164-11	o	CABLE, FLAT(1.0MM PICH)(13CORE)

CB-31 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-529-A	o	MOUNTED CIRCUIT BOARD, CB-31 (M)
C701	1-162-288-31	s	CERAMIC 330PF 10% 50V
CN701	1-537-315-11	s	TERMINAL BOARD
CN702	1-590-163-11	o	CABLE, FLAT(1.0MM PICH)(16CORE)
D701	8-719-918-76	s	DIODE GL-3PR9
D702	8-719-109-89	s	DIODE RD5.6ES-B2
D703	8-719-109-89	s	DIODE RD5.6ES-B2
D704	8-719-109-89	s	DIODE RD5.6ES-B2
D705	8-719-110-83	s	DIODE RD36ES-B2
F701	⚠1-532-775-11	s	FUSE 0.8A 125V
FL701	1-236-071-11	s	ENCAPSULATED COMPONENT
R701	1-249-421-11	s	CARBON 2.2K 5% 1/4W
R702	1-249-412-11	s	CARBON 390 5% 1/4W
R703	1-247-804-11	s	CARBON 75 5% 1/4W
SW701	1-570-472-11	s	SWITCH, KEY BOARD
SW702	1-570-472-11	s	SWITCH, KEY BOARD
SW705	1-572-529-11	s	SWITCH, SLIDE
SW706	1-572-528-11	s	SWITCH, SLIDE

FC-30 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-353-A	o	MOUNTED CIRCUIT BOARD, FC-30E7(UC)
1pc	A-7520-527-A	o	MOUNTED CIRCUIT BOARD, FC-30C5(EK)
C504	1-126-602-11	s	ELECT 3.3uF 20% 50V
C507	1-163-009-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C508	1-124-779-00	s	ELECT 10uF 20% 16V
C509	1-163-009-11	s	CERAMIC, CHIP 0.001uF 10% 50V
C510	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C511	1-124-778-00	s	ELECT 22uF 20% 6.3V
C512	1-163-115-00	s	CERAMIC, CHIP 82PF 5% 50V
C513	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C514	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C515	1-124-779-00	s	ELECT 10uF 20% 16V
C516	1-124-778-00	s	ELECT 22uF 20% 6.3V
C517	1-124-778-00	s	ELECT 22uF 20% 6.3V
C518	1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C519	1-124-779-00	s	ELECT 10uF 20% 16V
C520	1-135-092-21	s	TANTALUM, CHIP 3.3uF 10% 16V
C521	1-124-779-00	s	ELECT 10uF 20% 16V
C522	1-124-779-00	s	ELECT 10uF 20% 16V
C523	1-124-779-00	s	ELECT 10uF 20% 16V
C524	1-124-779-00	s	ELECT 10uF 20% 16V
C525	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C526	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C527	1-163-235-11	s	CERAMIC 22PF 5% 50V
C528	1-163-235-11	s	CERAMIC 22PF 5% 50V
C529	1-163-235-11	s	CERAMIC 22PF 5% 50V
C530	1-135-181-21	s	TANTAL 4.7uF 10% 6.3V
CN501	1-569-607-11	s	CONNECTOR, BOARD TO BOARD 24P
CN502	1-565-879-11	s	PIN, CONNECTOR (PC BOARD) 7P
CN503	1-568-368-41	s	CONNECTOR, BOARD TO BOARD 20P
D501	8-719-104-34	s	DIODE 1S2836(EK)
	8-719-400-20	s	DIODE MA152WA(UC)
D502	8-719-104-34	s	DIODE 1S2836(EK)
	8-719-400-20	s	DIODE MA152WA(UC)
D503	8-719-104-34	s	DIODE 1S2836(EK)
	8-719-400-20	s	DIODE MA152WA(UC)
IC502	8-759-100-93	s	IC UPC393G2
IC503	8-759-100-94	s	IC UPC358G2
IC504	8-759-946-00	s	IC MB88341PFV
IC505	8-759-038-60	s	IC SC406672FU
IC506	8-759-937-56	s	IC S-8054ALB-LM-S
IC507	8-759-031-84	s	IC SC7S04F
IC508	8-759-032-23	s	IC MC74HC74AF
IC509	8-759-032-23	s	IC MC74HC74AF
IC510	8-759-100-95	s	IC UPC324G2
L501	1-412-030-11	s	INDUCTOR CHIP 22uH
L502	1-412-030-11	s	INDUCTOR CHIP 22uH
Q504	8-729-402-84	s	TRANSISTOR XN4601
Q507	8-729-402-84	s	TRANSISTOR XN4601
Q508	8-729-402-84	s	TRANSISTOR XN4601
Q509	8-729-100-66	s	TRANSISTOR 2SC1623
Q510	8-729-216-22	s	TRANSISTOR 2SA1162
R516	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R517	1-216-079-00	s	METAL, CHIP 18K 5% 1/10W
R518	1-216-107-00	s	METAL, CHIP 270K 5% 1/10W
R519	1-216-113-00	s	METAL, CHIP 470K 5% 1/10W

(FC-30 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R525	1-216-117-00	s	METAL 680K 5% 1/10W
R526	1-216-105-00	s	METAL, CHIP 220K 5% 1/10W
R529	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R530	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R531	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R532	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R533	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R534	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R535	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R536	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R537	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R538	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R539	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R540	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R541	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R542	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R543	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R544	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R545	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R546	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R547	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R548	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R549	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R550	1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R551	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R552	1-216-071-00	s	METAL, CHIP 8.2K 5% 1/10W
R553	1-216-085-00	s	METAL, CHIP 33K 5% 1/10W
R554	1-216-045-00	s	METAL, CHIP 680 5% 1/10W(EK)
	1-216-047-00	s	METAL, CHIP 820 5% 1/10W(UC)
R555	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R556	1-216-748-11	s	METAL, CHIP 39K 1% 1/10W
R557	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R558	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R559	1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R560	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R561	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R562	1-216-097-00	s	METAL, CHIP 100K 5% 1/10W
R563	1-216-061-00	s	METAL, CHIP 3.3K 5% 1/10W
R564	1-216-077-00	s	METAL, CHIP 15K 5% 1/10W
R565	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R566	1-216-295-00	s	METAL, CHIP 0 5% 1/10W(UC)
R567	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R568	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R569	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R570	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R571	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W(UC)
	1-216-748-11	s	METAL, CHIP 39K 1% 1/10W(EK)
R580	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R581	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R582	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R583	1-216-295-00	s	METAL, CHIP 0 5% 1/10W(EK)
R584	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
SW502	1-570-602-11	s	SWITCH, DIP 2-CKT
X501	1-567-819-11	s	VIBRATOR, CERAMIC 4MHz

H-30 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-508-A	o	MOUNTED CIRCUIT BOARD, H-30
1pc	3-165-271-01	o	PLATE, CONNECTOR
2pcs	4-386-536-01	s	SHEET, SILICON
2pcs	7-621-772-38	s	SCREW +B 2X6
C601	1-124-234-00	s	ELECT 22uF 20% 16V
CN601	1-580-172-11	s	CONNECTOR, MICRO (RECEPTACLE)4P
CN602	1-566-762-11	o	PIN, CONNECTOR (PC BOARD) 7P
D601	8-719-110-17	s	DIODE RD10ES-B2
L601	1-408-400-00	s	INDUCTOR 1.8uH
Q601	8-729-188-23	s	TRANSISTOR 2SD882
Q602	8-729-900-61	s	TRANSISTOR DTA114ES
Q603	8-729-306-92	s	TRANSISTOR 2SD669A
R601	1-249-427-11	s	CARBON 6.8K 5% 1/4W
R602	1-249-437-11	s	CARBON 47K 5% 1/4W
R603	1-249-413-11	s	CARBON 470 5% 1/4W

LC-31 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C801	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C802	1-162-912-11	s	CERAMIC 7PF 0.5PF 50V
C803	1-162-912-11	s	CERAMIC 7PF 0.5PF 50V
C804	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C805	1-135-181-21	s	TANTAL 4.7uF 10% 6.3V
CN801	1-564-317-11	o	PIN, BOARD TO BOARD 5P
CT801	1-141-311-11	s	CAR, TRIMMER 20PF
D801	8-713-300-88	s	DIODE 1T33C-01
IC801	8-759-038-46	s	IC SC7S00F
L801	1-410-373-31	s	INDUCTOR CHIP 2.2uH
L802	1-412-030-11	s	INDUCTOR CHIP 22uH
R801	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R802	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W

MB-31 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-503-A	o	MOUNTED CIRCUIT BOARD, MB-31
C201	1-124-778-00	s	ELECT 22uF 20% 6.3V
C202	1-124-778-00	s	ELECT 22uF 20% 6.3V
C203	1-124-471-00	s	ELECT 1000uF 20% 6.3V
C204	1-126-105-11	s	ELECT 1000 20% 35V
C205	1-124-442-00	s	ELECT 330uF 20% 6.3V
C206	1-126-200-11	s	ELECT 10uF 20% 35V
C207	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C208	1-124-442-00	s	ELECT 330uF 20% 6.3V
C209	1-126-200-11	s	ELECT 10uF 20% 35V
C211	1-124-485-11	s	ELECT 330uF 20% 35V
C212	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C213	1-126-206-11	s	ELECT 100uF 20% 6.3V
C214	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C215	1-126-397-11	s	ELECT, CHIP 33uF 20% 25V
C216	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C217	1-126-204-11	s	ELECT 47uF 20% 16V
C218	1-124-472-11	s	ELECT 470uF 20% 10V
CN201	1-946-455-11	o	HARNESS (CONNECTOR ASSY 7P)
CN202	1-566-532-11	s	CONNECTOR, FPC (ZIF) 16P
CN203	1-568-336-11	s	CONNECTOR, BOARD TO BOARD 20P
CN204	1-568-338-11	s	CONNECTOR, BOARD TO BOARD 24P
CN205	1-568-338-11	s	CONNECTOR, BOARD TO BOARD 24P
CN206	1-568-338-11	s	CONNECTOR, BOARD TO BOARD 24P
CN207	1-568-336-11	s	CONNECTOR, BOARD TO BOARD 20P
CN208	1-568-336-11	s	CONNECTOR, BOARD TO BOARD 20P
CN209	1-946-456-11	o	HARNESS (CONNECTOR ASSY 3P)
CN210	1-946-457-11	o	HARNESS (CONNECTOR ASSY 4P)
D201	8-719-200-91	s	DIODE 11EQS10
D202	8-719-200-91	s	DIODE 11EQS10
D203	8-719-104-34	s	DIODE 1S2836
D204	8-719-106-08	s	DIODE RD6.2M-B2
D205	8-719-104-34	s	DIODE 1S2836
IC201	8-759-300-71	s	IC HD14053BFP
L201	1-412-030-11	s	INDUCTOR CHIP 22uH
PU201	1-466-429-11	s	CONVERTER UNIT, DC-DC
Q201	8-729-100-66	s	TRANSISTOR 2SC1623
Q202	8-729-421-23	s	TRANSISTOR XN1216
Q203	8-729-216-22	s	TRANSISTOR 2SA1162
Q204	8-729-100-66	s	TRANSISTOR 2SC1623
Q205	8-729-900-53	s	TRANSISTOR DTC114EK
Q206	8-729-901-04	s	TRANSISTOR DTA114EK
Q207	8-729-900-53	s	TRANSISTOR DTC114EK
Q208	8-729-901-04	s	TRANSISTOR DTA114EK
Q209	8-729-900-53	s	TRANSISTOR DTC114EK
R201	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R202	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R203	1-216-670-11	s	METAL, CHIP 6.2K 0.5% 1/10W
R204	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R205	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R206	1-216-638-11	s	METAL, CHIP 300 0.5% 1/10W
R207	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R208	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R209	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R210	1-216-079-00	s	METAL, CHIP 18K 5% 1/10W

(MB-31 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R211	1-216-067-00	s	METAL, CHIP 5.6K 5% 1/10W
R212	1-216-091-00	s	METAL, CHIP 56K 5% 1/10W
R213	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R214	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R215	1-216-085-00	s	METAL, CHIP 33K 5% 1/10W
R216	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R217	1-216-638-11	s	METAL, CHIP 300 0.5% 1/10W
R218	1-216-638-11	s	METAL, CHIP 300 0.5% 1/10W
R219	1-216-638-11	s	METAL, CHIP 300 0.5% 1/10W
R220	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R221	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R222	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W

PR-32 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-346-A	o	MOUNTED CIRCUIT BOARD, PR-32C7(EK)
1pc	A-7515-349-A	o	MOUNTED CIRCUIT BOARD, PR-32E7(UC)
C301	1-124-779-00	s	ELECT 10uF 20% 16V
C302	1-124-779-00	s	ELECT 10uF 20% 16V
C303	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C304	1-124-779-00	s	ELECT 10uF 20% 16V
C305	1-124-779-00	s	ELECT 10uF 20% 16V
C306	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C307	1-163-088-00	s	CERAMIC, CHIP 5PF 50V
C308	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C309	1-163-099-00	s	CERAMIC, CHIP 18PF 5% 50V
C310	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C311	1-163-097-00	s	CERAMIC, CHIP 15PF 5% 50V
C330	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C331	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C332	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C333	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C334	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C335	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C336	1-163-109-00	s	CERAMIC, CHIP 47PF 5% 50V
C337	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C338	1-124-779-00	s	ELECT 10uF 20% 16V
C339	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C340	1-124-779-00	s	ELECT 10uF 20% 16V
C341	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C342	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C343	1-124-778-00	s	ELECT 22uF 20% 6.3V
C344	1-124-778-00	s	ELECT 22uF 20% 6.3V
C345	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C346	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C347	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C348	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C349	1-135-180-21	s	TANTAL 3.3uF 20% 6.3V
C350	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C351	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C352	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C353	1-135-180-21	s	TANTAL 3.3uF 20% 6.3V
C354	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C360	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 50V
C361	1-126-206-11	s	ELECT 100uF 20% 6.3V
C362	1-124-778-00	s	ELECT 22uF 20% 6.3V
C363	1-124-778-00	s	ELECT 22uF 20% 6.3V
C364	1-124-778-00	s	ELECT 22uF 20% 6.3V
C365	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
CN301	1-568-368-41	s	CONNECTOR, BOARD TO BOARD 20P
CN302	1-568-368-41	s	CONNECTOR, BOARD TO BOARD 20P
CT301	1-141-347-11	s	CAP, TRIMMER 10PF
FL301	1-415-846-21	s	DELAY LINE, LC
IC301	8-759-037-41	s	IC MC14577AF
IC302	8-759-100-94	s	IC UPC358G2
IC330	8-752-038-99	s	IC CXA1392R
IC360	8-759-037-30	s	IC MC14576AF
L301	1-410-383-31	s	INDUCTOR CHIP 15UH
L302	1-412-030-11	s	INDUCTOR CHIP 22uH
L360	1-412-030-11	s	INDUCTOR CHIP 22uH

(PR-32 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q301	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q302	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q303	8-729-402-84	s	TRANSISTOR XN4601
Q304	8-729-402-84	s	TRANSISTOR XN4601
Q330	8-729-421-23	s	TRANSISTOR XN1216
Q331	8-729-216-22	s	TRANSISTOR 2SA1162
R301	1-216-327-11	s	METAL 2K 1% 1/10W
R302	1-216-047-00	s	METAL, CHIP 820 5% 1/10W
R303	1-216-071-00	s	METAL, CHIP 8.2K 5% 1/10W
R304	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R305	1-216-071-00	s	METAL, CHIP 8.2K 5% 1/10W
R306	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R307	1-216-077-00	s	METAL, CHIP 15K 5% 1/10W
R308	1-216-748-11	s	METAL, CHIP 39K 1% 1/10W
R310	1-216-027-00	s	METAL, CHIP 120 5% 1/10W
R311	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R312	1-216-059-00	s	METAL, CHIP 2.7K 5% 1/10W
R313	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R314	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R315	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R316	1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R317	1-216-085-00	s	METAL, CHIP 33K 5% 1/10W
R318	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R330	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R331	1-216-075-00	s	METAL, CHIP 12K 5% 1/10W
R332	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R333	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R334	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R335	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R336	1-216-075-00	s	METAL, CHIP 12K 5% 1/10W
R337	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R338	1-216-097-00	s	METAL, CHIP 100K 5% 1/10W(EK)
R339	1-216-295-00	s	METAL, CHIP 0 5% 1/10W(UC)
R340	1-216-079-00	s	METAL, CHIP 18K 5% 1/10W
R341	1-216-083-00	s	METAL, CHIP 27K 5% 1/10W
R342	1-216-053-00	s	METAL, CHIP 1.5K 5% 1/10W
R360	1-216-748-11	s	METAL, CHIP 39K 1% 1/10W
R361	1-216-091-00	s	METAL, CHIP 56K 5% 1/10W
R362	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R363	1-216-061-00	s	METAL, CHIP 3.3K 5% 1/10W
R364	1-216-061-00	s	METAL, CHIP 3.3K 5% 1/10W
RV301	1-241-178-21	s	RES, ADJ, CERMET 4.7K

TG-31 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7515-347-A	o	MOUNTED CIRCUIT BOARD, TG-31C7(EK) (WITH LC-31)
1pc	A-7515-348-A	o	MOUNTED CIRCUIT BOARD, TG-31E7(UC) (WITH LC-31)
C401	1-164-005-11	s	CERAMIC, CHIP 0.47uF 25V
C402	1-135-176-21	s	TANTAL 0.68uF 20% 35V
C403	1-126-602-11	s	ELECT 3.3uF 20% 50V
C404	1-162-974-11	s	CERAMIC 0.01uF 50V
C405	1-126-603-11	s	ELECT 4.7uF 20% 35V
C406	1-162-974-11	s	CERAMIC 0.01uF 50V
C407	1-126-602-11	s	ELECT 3.3uF 20% 50V
C408	1-162-974-11	s	CERAMIC 0.01uF 50V
C409	1-135-070-00	s	TANTALUM, CHIP 0.1uF 10% 35V
C410	1-135-212-21	s	TANTAL 2.2uF 20% 35V
C411	1-162-974-11	s	CERAMIC 0.01uF 50V
C412	1-124-779-00	s	ELECT 10uF 20% 16V
C413	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C414	1-162-974-11	s	CERAMIC 0.01uF 50V
C415	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C417	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C418	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C420	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C421	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C422	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C424	1-162-974-11	s	CERAMIC 0.01uF 50V
C425	1-164-156-11	s	CERAMIC 0.1uF 25V
C426	1-164-156-11	s	CERAMIC 0.1uF 25V
C427	1-164-156-11	s	CERAMIC 0.1uF 25V
C428	1-164-005-11	s	CERAMIC, CHIP 0.47uF 25V
C429	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C430	1-162-974-11	s	CERAMIC 0.01uF 50V
C431	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C433	1-162-974-11	s	CERAMIC 0.01uF 50V
C434	1-164-156-11	s	CERAMIC 0.1uF 25V
C435	1-164-156-11	s	CERAMIC 0.1uF 25V
C436	1-162-974-11	s	CERAMIC 0.01uF 50V
C437	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C438	1-164-156-11	s	CERAMIC 0.1uF 25V
C439	1-164-156-11	s	CERAMIC 0.1uF 25V
C440	1-162-974-11	s	CERAMIC 0.01uF 50V
C441	1-162-974-11	s	CERAMIC 0.01uF 50V
C442	1-162-974-11	s	CERAMIC 0.01uF 50V
C444	1-126-205-11	s	ELECT 47uF 20% 6.3V
C445	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C446	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C447	1-162-974-11	s	CERAMIC 0.01uF 50V
C448	1-163-109-00	s	CERAMIC, CHIP 47PF 5% 50V
C449	1-163-109-00	s	CERAMIC, CHIP 47PF 5% 50V
C451	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C456	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C458	1-101-361-00	s	CERAMIC 150PF 5% 50V
C459	1-101-004-00	s	CERAMIC 0.01uF 50V
C464	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C465	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C466	1-162-974-11	s	CERAMIC 0.01uF 50V
C467	1-162-974-11	s	CERAMIC 0.01uF 50V
C468	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C469	1-164-161-11	s	CERAMIC, CHIP 0.0022uF 10% 100V
C470	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V

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Ref. No. or Q'ty	Part No.	SP	Description
C471	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C472	1-163-113-00	s	CERAMIC, CHIP 68PF 5% 50V
C473	1-135-181-21	s	TANTAL 4.7uF 10% 6.3V
C474	1-135-091-00	s	TANTALUN, CHIP 1uF 10% 16V
C475	1-135-162-21	s	TANTAL 33uF 10% 6.3V
C476	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C477	1-162-919-11	s	CERAMIC, CHIP 22PF 5% 50V
C478	1-163-227-11	s	CERAMIC 10PF 5% 50V
C479	1-163-105-00	s	CERAMIC, CHIP 33PF 5% 50V
C480	1-162-974-11	s	CERAMIC 0.01uF 50V
C481	1-162-974-11	s	CERAMIC 0.01uF 50V
C482	1-162-974-11	s	CERAMIC 0.01uF 50V
C483	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C484	1-135-180-21	s	TANTAL 3.3uF 20% 6.3V
C485	1-162-974-11	s	CERAMIC 0.01uF 50V
C486	1-135-181-21	s	TANTAL 4.7uF 10% 6.3V
C487	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C488	1-135-072-21	s	TANTALUM, CHIP 0.22uF 10% 35V
C489	1-162-974-11	s	CERAMIC 0.01uF 50V
C490	1-164-156-11	s	CERAMIC 0.1uF 25V
C491	1-162-974-11	s	CERAMIC 0.01uF 50V
C492	1-162-974-11	s	CERAMIC 0.01uF 50V
C494	1-135-157-21	s	TANTAL 10uF 10% 6.3V
C495	1-162-974-11	s	CERAMIC 0.01uF 50V
C496	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
C497	1-164-156-11	s	CERAMIC 0.1uF 25V
C498	1-164-156-11	s	CERAMIC 0.1uF 25V
C499	1-163-141-00	s	CERAMIC, CHIP 0.001uF 5% 50V
CN401	1-565-874-11	s	PIN, CONNECTOR (PC BOARD) 2P
CN402	1-566-529-11	s	CONNECTOR, FPC (ZIF) 13P
CN403	1-569-607-11	s	CONNECTOR, BOARD TO BOARD 24P
CN404	1-569-607-11	s	CONNECTOR, BOARD TO BOARD 24P
D401	8-719-800-76	s	DIODE 1SS226
D402	8-719-400-20	s	DIODE MA152WA
D403	8-719-400-20	s	DIODE MA152WA
D404	8-719-400-20	s	DIODE MA152WA
D407	8-719-400-20	s	DIODE MA152WA
D480	8-719-404-46	s	DIODE MA110
IC401	8-752-054-61	s	IC CXA1390AR
IC402	8-759-030-74	s	IC SC14S66F
IC403	8-752-327-46	s	IC CXD1250M
IC405	8-752-335-49	s	IC CXD1252AR
IC406	8-752-326-08	s	IC CXD1159Q
IC408	8-759-925-88	s	IC SN74HC51NS
IC409	8-759-031-84	s	IC SC7S04F
IC411	8-759-250-81	s	IC TC5081AP
IC412	8-759-206-28	s	IC TC74HC123F
IC413	8-759-206-28	s	IC TC74HC123F
IC415	8-759-710-12	s	IC NJM2230M
IC416	8-759-100-94	s	IC UPC358G2
IC417	8-759-038-46	s	IC SC7S00F
IC418	8-759-038-46	s	IC SC7S00F
IC419	8-759-038-46	s	IC SC7S00F
IC420	8-759-031-58	s	IC SC7SU04F
IC421	8-759-038-46	s	IC SC7S00F
L401	1-412-030-11	s	INDUCTOR CHIP 22uH
L402	1-412-030-11	s	INDUCTOR CHIP 22uH

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Ref. No. or Q'ty	Part No.	SP	Description
L403	1-412-030-11	s	INDUCTOR CHIP 22uH
L406	1-412-030-11	s	INDUCTOR CHIP 22uH
L408	1-410-373-31	s	INDUCTOR CHIP 2.2uH
L409	1-412-030-11	s	INDUCTOR CHIP 22uH
Q401	8-729-100-66	s	TRANSISTOR 2SC1623
Q402	8-729-421-23	s	TRANSISTOR XN1216
Q403	8-729-216-22	s	TRANSISTOR 2SA1162
Q405	8-729-402-84	s	TRANSISTOR XN4601
Q406	8-729-100-66	s	TRANSISTOR 2SC1623
Q407	8-729-402-84	s	TRANSISTOR XN4601
Q408	8-729-100-66	s	TRANSISTOR 2SC1623
Q409	8-729-216-22	s	TRANSISTOR 2SA1162
Q410	8-729-100-66	s	TRANSISTOR 2SC1623
Q411	8-729-216-22	s	TRANSISTOR 2SA1162
Q412	8-729-900-53	s	TRANSISTOR DTC114EK
Q413	8-729-100-66	s	TRANSISTOR 2SC1623
Q414	8-729-100-66	s	TRANSISTOR 2SC1623
Q415	8-729-900-53	s	TRANSISTOR DTC114EK
Q418	8-729-216-22	s	TRANSISTOR 2SA1162
R401	1-216-847-11	s	METAL, CHIP 150K 5% 1/16W
R402	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R403	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R404	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R405	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R406	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R407	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R408	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R409	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R410	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R411	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R412	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R413	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R414	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R415	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R416	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R417	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R418	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R419	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R420	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R421	1-216-820-11	s	METAL, CHIP 820 5% 1/16W
R422	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R423	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R424	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R425	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R426	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W
R427	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R430	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R432	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R438	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R439	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R440	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R441	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R447	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W(EK)
R448	1-216-864-11	s	METAL, CHIP 0 5% 1/16W(UC)
R450	1-216-864-11	s	METAL, CHIP 0 5% 1/16W
R451	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R452	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R453	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R454	1-216-838-11	s	METAL, CHIP 27K 5% 1/16W

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Ref. No. or Q'ty	Part No.	SP	Description
R455	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R456	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R457	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R458	1-216-840-11	s	METAL, CHIP 39K 5% 1/16W
R459	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R460	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R461	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R462	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R463	1-216-827-11	s	METAL, CHIP 3.3K 5% 1/16W
R464	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R465	1-216-822-11	s	METAL, CHIP 1.2K 5% 1/16W
R466	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R467	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R468	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R469	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R470	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R471	1-216-839-11	s	METAL, CHIP 33K 5% 1/16W
R472	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R473	1-216-819-11	s	METAL, CHIP 680 5% 1/16W
R474	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R475	1-216-846-11	s	METAL, CHIP 120K 5% 1/16W
R476	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R477	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R478	1-216-827-11	s	METAL, CHIP 3.3K 5% 1/16W(EK)
R479	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R480	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R486	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R487	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R488	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R489	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R491	1-216-829-11	s	METAL, CHIP 4.7K 5% 1/16W
R492	1-216-816-11	s	METAL, CHIP 390 5% 1/16W
X402	1-567-708-12	s	VIBRATOR, CRYSTAL 28.636363MHz(UC)
	1-567-732-12	s	VIBRATOR, CRYSTAL 28.375MHz(EK)

6-3. PACKING MATERIAL & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7475-149-A	s	CONNECTOR ASSY, MICRO
2pcs	3-166-524-01	o	CUSHION
1pc	3-173-143-01	o	INDIVIDUAL CARTON(EK)
1pc	3-173-144-01	o	INDIVIDUAL CARTON(UC)
1pc	3-701-623-00	s	BAG, POLYETHYLENE N-EH
1pc	3-701-628-00	s	BAG, POLYETHYLENE
1pc	3-753-588-11	s	MANUAL, INSTRUCTION(EK)
1pc	⚠3-753-588-21	s	MANUAL, INSTRUCTION(UC)
1pc	3-795-581-21	o	SAFEGUARD, IMPORTANT(UC)